# From crystal to crust: the Proterozoic crustal evolution of southwest Norway

Thesis submitted for the degree of Doctor of Philosophy at the University of Leicester

Nicholas Michael William Roberts

Department of Geology University of Leicester

October 2010

## From crystal to crust: the Proterozoic crustal evolution of southwest Norway

### Nicholas Michael William Roberts

### Abstract

The geology of the Suldal Sector, southwest Norway, comprises exposures from three orogenic periods; the Telemarkian, Sveconorwegian and Caledonian. Telemarkian (~1500 Ma) basement rocks are interpreted to be the oldest crust in the region; these are intruded by Sveconorwegian granitoid intrusions (~1070-930 Ma). Crystalline nappe units overlie the Mesoproterozoic basement, and from reconnaissance U-Pb dating and zircon hafnium isotopes, are believed to comprise slices of the Mesoproterozoic Norwegian continental margin.

The Telemarkian basement comprises meta-plutonic/volcanic lithologies that represent the deformed upper crustal section of a continental arc - the Suldal Arc; U-Pb dating suggests this arc was active from ~1520 to 1475 Ma. Whole-rock geochemistry and hafnium and oxygen isotopes measured in zircon, suggest that arc magmatism recycled older continental crust (20-50% contribution) that had been mixed with mantle-derived material in the lower crust; the older crustal component comprised late-Palaeoproterozoic sedimentary material derived from the Fennoscandian continent. During the arc's evolution, dehydration of mafic source magma induced by heat from magmatic underplating, and subsequent melting of dehydrated crust enhanced by asthenospheric upwelling, allowed for the intrusion of iron-enriched tholeiitic magmas. The Suldal arc and by extension, the Telemarkia terrane, represent the last stages of continental crust formation within a retreating accretionary orogen that was active since ~1.8 Ga.

Based on whole-rock geochemistry, U-Pb, hafnium and oxygen isotopes in zircon, Sveconorwegian granite suites formed between 1.07 and 0.92 Ga, and are largely derived from ~1.5 Ga mafic lower crust with a limited contribution of juvenile mantle-derived material. The geodynamic setting of granitic magmatism evolved from supra-subduction, to overthickened crust, to thinned crust with possible lithospheric delamination. The varying geochemistry of the granite suites (I- to A-type) is controlled not by geodynamic setting, but dominantly by water content in the magma source. Sveconorwegian deformation in the Suldal Sector is bracketed between ~1069 and ~1047 Ma by intrusions of the Storlivatnet plutonic complex.

Acknowledgements

### Acknowledgements

First and foremost I'd like to acknowledge the person that started the ball-rolling, the late Prof. Tim Brewer. Tim's involvement in this project was unfortunately short-lived, however, his rigorous and comprehensive approach to Precambrian geology, applied with his consistently high level of enthusiasm and wit, have given me a want to succeed and excel and have provided motivation for this project that still continues today.

By agreeing to my supervision, Prof. Randy Parrish probably took on a lot more than expected, but has continued to provide a wealth of knowledge, assistance, constructive criticism as well as praise, and without his input this thesis would be an order of magnitude thinner. Dr. Mike Norry also found himself supervising this project, and continues to be a geochemical 'rock' that one can always bounce ideas off; perhaps more important though is the holistic ideology that influenced me under Norry's tutelage whilst I was as an undergraduate at Leicester.

If during this project Randy and Norry play the role of espoused fathers, then I would liken Steve Noble to an uncle: taking a background role, but always providing unrestrained praise and encouragement, and willing to drop anything to help. Matt Horstwood and Dan Condon have also played key roles in this project, having made sure that I actually had some data to write about. Also at NIGL I would like to thank John Cottle, Jenny Bearcock, Vanessa Pashley, Laura Howell and Adrian Wood for providing technical and analytical assistance. In Edinburgh I owe tremendous thanks to John Craven for enabling me to walk away from the Ionprobe with some useable data, having arrived with the worst prepared samples he'd ever let on the machine!

Mogens Marker and Trond Slagstad at the Norwegian Geological Survey provided indispensible support in my first field season, and have since provided useful discussion, as well as complete access to their samples and data which have been a great benefit to this project. Rich Walker, Rhys Langford and Chris McDonald are also thanked for their assistance in the field.

At the University of Leicester I would like to thank members of the analytical staff, Nick Marsh, Colin Cunningham, Rob Kelly and Rob Wilson, and also all of the academic, technical and administrative staff; everyone at Leicester has made life pretty easy going... it does rather discourage one from 'getting a real job'.

Acknowledgements

I would like to thank the attendees of the Sveconorwegian fieldtrip that formed part of the International Geological Congress in 2008. The trip provided a great insight into the quirks, unresolved debates, and pros and cons of Precambrian geology and geochronology of Scandinavia; there are too many people to list, but I would like to mention Bernard Bingen for many useful discussions, manuscripts and data. Thanks also to Quentin Crowley, Mike Flowerdew and the guys from BAS for making a long stay in Oslo more enjoyable through a fair amount of (expensive) beer-drinking.

I am grateful to my office mates at Leicester (Pete, Becky and Alex) for keeping the insanity to acceptably low-levels, with a distinctive lack of talking-shop, a passion for sharing gossip, and a keenness to whinge about... well anything that needed whinging about. During my 8 years at Leicester there have been too many other postgrads to name, who have provided support pastorally, academically, and most importantly at the bar. I thank you all.

Outside of geology, many friends have provided support, whether it be a jest about 'going time-travelling', the odd 'so aren't you finished yet?', or just taking my mind off (which was surprisingly hard) very old non-mineralised non-oil bearing non-distinctive grey rocks in Norway. Many friends and family still ask when I'm going to get a job, but if academia isn't classed as a real job, then hopefully the answer will continue to be never.

I owe a great deal to my parents, who have provided unchecked loving support, whether it be motivationally or financially (especially during the days when I believed I still didn't own enough climbing gear, or when my car needed fixing!). And finally I have to thank Abi, who has always given me the most encouragement and support, and for always being there.

Thank you

Nick Roberts

May 2010

1	Intr	Introduction		
	1.1	Background and rationale	13	
	1.1.	1 Topical aspects	13	
	1.1.	2 Regional aspects	16	
	1.2	Aims	16	
	1.3	Outline	17	
	1.4	Presentations	18	
	1.5	Data Sources	19	
2	The	geology of the Suldal Sector, southwest Norway	20	
	2.1	Regional Geology	20	
	2.2	Geology of the Suldal Sector	24	
	2.2.	1 Description of units	24	
	2.2.	2 Structure	33	
	2.2.	3 Metamoprhism (summary)	34	
•	2.3	Conclusions	34	
3	A cl	hemical abrasion LA-MC-ICP-MS and ID-TIMS U-Pb study of Mesoproterozo	))C	
m	agmati	ism in the Suldal Sector: constraints on Telemarkian and Sveconorwegian crus	tal 20	
ev	olution	l	30	
	3.I 2.2	Introduction	30 27	
	3.4 2.2	Geological Framework	31 27	
	3.3 2.4	Sample Descriptions	37 A1	
	<b>3.4</b>	Sample Descriptions	<b>+1</b> //1	
	3.4	$2 SAS_{-02}$ tohante dyke	+1 /1	
	3.4	3 SA7-04 rhyodacitic gneiss	41 41	
	3.4	4 SA7-86 metagabbro	41 42	
	3.4	5 SA7-58 hiotite nornhyritic granite	42	
	3.4	6 SA7-130 banded rhyodacitic gneiss	42	
	3.4	7 SA7-91 biotite granite	42	
	3.4.	8 SA3-60 banded rhyolitic gneiss	44	
	3.4.	9 SA3-04 granodiorite gneiss	44	
	3.4.	10 SA3-01 biotite-hornblende porphyritic granite	44	
	3.4.	11 SA8-69 porphyritic granodiorite	44	
	3.5	Results	45	
	3.5.	1 SA3-02 tonalite dyke	45	
	3.5.	2 SA8-45 banded felsic gneiss	45	
	3.5.	3 SA7-04 rhyodacitic gneiss	46	
	3.5.	4 SA7-86 metagabbro	46	
	3.5.	5 SA7-58 biotite porphyritic granite	51	
	3.5.	6 SA7-130 banded rhyodacitic gneiss	52	
	3.5.	7 SA7-91 biotite granite	52	
	3.5.	8 SA3-60 banded rhyolitic gneiss	52	
	3.5.	9 SA3-04 granodiorite gneiss	52	
	3.5.	10 SA3-01 biotite-hornblende porphyritic granite	53	
	3.5.	11 SA8-69 porphyritic granodiorite	53	
	3.6	Discussion	53	
	3.6.	1 Chemical abrasion for laser ablation studies	53	

	3.6.2	2 1.5 Ga Telemarkian crustal growth	. 57
	3.6.	3 Sveconorwegian events	. 58
	3.7	Conclusions	. 61
4	The	petrogenesis of 1.5 Ga magmatism in the Suldal Sector	. 64
	4.1	Introduction	. 64
	4.2	Geological Framework	. 64
	4.3	Geochemistry	. 65
	4.3.	1 Analytical techniques	. 65
	4.3.	2 Element mobility	. 65
	4.3.	3 Sauda Grey Gneiss Association	. 66
	4.3.4	4 Zinc Mine Banded Gneiss	. 73
	4.3.	5 Amphibolites	. 73
	4.3.	6 Granitoids	. 74
	4.4	Petrogenesis	. 74
	4.4.	1 Grey Gneiss	. 74
	4.4.	2 Amphibolites	. 77
	4.5	Discussion	. 86
	4.5.	1 Origin of A-type granites	. 86
	4.6	Conclusions	. 87
5	Con	tinental recycling in arc magmas: Hf-O isotope constraints on Telemarkian (1.	.52-
1.	48 Ga)	magmatism	. 88
	5.1	Introduction	. 88
	5.2	Geological setting	. 89
	5.3	Analytical methods	. 93
	5.3.	1 Zircon U-Pb isotopes	. 93
	5.3.	2 Zircon Hf isotopes	. 93
	5.3.	3 Zircon O isotopes	. 95
	5.4	Results	. 96
	5.4.	1 Zircon Hf isotopes	. 96
	5.4.	2 Zircon oxygen isotopes	. 97
	5.5	Discussion	. 98
	5.5.	Previous isotopic constraints	. 98
	5.5.	2 Zircon inheritance	100
	5.5.	Geochemical indicator of sources	101
	5.5.4	4 Nature of crustal and mantle components	102
	5.5.:	5 Processes of continental recycling	104
(	<b>3.</b> 0	Conclusions	100
0 C-	Geo	chemical and mi-O constraints on the petrogenesis of early- to la	110- 100
3	6 1	wegian magmausin in 5. ivor way	1Vð 100
	0.1 6 2	Drovious studios	1Vð 100
	0.4 6 3	A nalytical matheda	107 112
	0.J 64	Analytical Incultus	113
	<b>U.H</b>	1 cu ogi apily and geochemistry	112
	0.4. 6 / /	7 The Feda suite	113
	0.4. 6 / <sup>/</sup>	2 Increta sunc	117
	64	4 Zircon saturation temperature	118
	6.5	Results – Hf isotopes	119
	~~~		/

6	<b>5.6</b>	Results	s – Oxygen isotopes	119
6	<b>5.</b> 7	Discus	sion	120
	6.7.	1 Hi	f-O constraints on magma source	120
	6.7.2	2 Fo	rmation of silica melts – magma mixing versus fractional crystallisation.	121
	6.7.	3 Ge	eochemical constraints on magma source	123
	6.7.4	4 Le	eucogranite formation	126
	6.7.:	5 Co	ontinental recycling during Sveconorwegian magmatism	127
	6.7.	6 Re	econciling the Hf-O and geochemical constraints	129
	6.7.	7 Ge	eodynamic setting	130
	6.7.3	8 Co	ontinental growth during Sveconorwegian magmatism	130
6	5.8	Conclu	isions	131
7	The	1.24 @	Ga Grossæ-Totak suite, a new age confirms an old correlation i	in the
Tel	emarl	k supra	crustals, southern Norway	132
7	7.1	Introd	uction	132
7	7.2	Geolog	ical setting	133
7	7.3	Sample	e description and results	135
7	7.4	Discus	sion	136
7	7.5	Conclu	isions	138
8	In-si	itu U-P	b and Hf isotopes constrain the age & provenance of the Hardangery	vidda-
Rvf	fvlke l	Nappe (	Complex. SW Norwegian Caledonides	140
8	3.1	Introd	uction	140
8	3.2	Geolog	ical Setting	140
	8.2.	1 He	plmasiø unit (Lower Allochthon)	142
	8.2.	2 St	orhei unit (Middle Allochthon)	143
	8.2.	3 D	vrskard unit (Middle Allochthon)	143
	8.2.4	4 Ky	vitenut unit (Middle Allochthon)	144
	8.2	5 Re	evsegg unit (Middle Allchthon)	144
8	8.3	Ration	ale for isotone work	
8	R.4	Sample	P Description	147
Ū	84	1 SA	A8-32 Holmasiø unit (fine-grained intermediate grev gneiss)	147
	8.4	$\frac{1}{2}$	A8-19 Storhei unit (coarse-grained granitic gneiss)	147
	8.4	2 SA 3 SA	A8-23 Dyrskard unit (fine-orained felsic oneiss)	147
	844	4 SA	A8-26 Kvitenut unit (mylonitic handed gneiss)	148
	8.4	5 SA	A8-27 Revsegg unit (garnet-mica gneiss)	148
8	85	Analyt	ical methods	149
8	».» R 6	Result	s – U-Ph	149
U	86	$1 \qquad SA$	A8-32 Holmasiø unit (fine-orained intermediate orev oneiss)	149
	8.6	$\frac{1}{2}$	A8-19 Storhei unit (coarse-grained granitic greiss)	149
	8.6	2 SA 3 SA	A8-23 Dyrskard unit (fine-grained felsic gneiss)	149
	8.64	4 SA	A8-26 Kvitenut unit (mylonitic handed gneiss)	151
	8.6	$\frac{1}{5}$	A8-27 Revsegg unit (garnet-mica gneiss)	151
9	8.7	Reculto	s = Hf	151
o R	 	Discus	sion	153
U	8.8	1 O1	igin of the nappe units	153
	8 8 <sup>/</sup>	) C	nthian-Telemarkian continental growth	155
	8 8 <sup>-</sup>	2 UI 3 Sr	reconorwegian orogeny in SW Norway	158
Q	0.0 2 0	Conch	isions	150 1 <b>50</b>
9	"' Disc	Useinn		161
-		CADDIUI10		TAT

9.1	Cru	stal evolution in the Telemarkian (1.52-1.48 Ga) period	161
9.1	1.1	'Indigenous' or 'Exotic' Telemarkia	162
9.1	1.2	A retreating accretionary orogenic model	165
9.2	Cru	stal evolution in the Sveconorwegian (1.06-0.92 Ga) period	166
9.3	The	e 'interorogenic' period	167
9.3	3.1	The Hallandian-Danopolonian event	168
9.4	A to	ectonic synthesis	169
9.5	Rea	iding the isotope barcode	172
9.5	5.1	Source versus time	173
9.5	5.2	Comparison with other evidence	174
9.5	5.3	Zircon inheritance	177
9.6	Sup	percontinents and global correlations	177
9.6	5.1	A global accretionary orogen?	177
9.6	5.2	Proterozoic supercontinents	181
9.7	Сог	ntinental growth – a final comment	183
9.7	7.1	A final comment on the final comment – continental versus crustal growth	184
10 Ap	pend	ix	187
10.1	XR	F methodology and precision	187
10.2	San	nple details	188
10.3	Wh	ole-rock geochemical data	201
10.4	U-F	b data	221
10.5	Haf	înium isotope data	232
10.6	Oxy	ygen isotope data – chapter 5	246
10.6	Oxy	ygen isotope data – chapter 6	248
10.6	U-F	b TIMS dataBibliography	254
10.6	Bib	liography	255

## List of figures

Fig. 1.1 Compilation of global mineral ages, ages of juvenile crust and U-Pb ages of detrital zircons, compared with periods of supercontinent formation.	14
Fig. 2.1 Map of the East European Craton, Precambrian domains in Fennoscandia and terranes in SW Fennoscandia.	20
Fig. 2.2 Geological map of SW Fennoscandia.	22
Fig. 2.3 Field photographs of Sauda Grey Gneiss outcrops.	26
Fig. 2.4 Field photographs of amphibolite outcrops.	27
Fig. 2.5 Field photographs of Grey Gneiss structures, Zinc Mine Banded Gneiss and the Nesflaten Suite.	28
Fig. 2.6 Field photographs of the Storlivatnet plutonic complex.	29
Fig. 2.7 to 2.12 Thin section photomicrographs of Grey Gneiss and amphibolites.	30
Fig. 2.13 to 2.18 Thin section photomicrographs of Grey Gneiss and amphibolites.	31
Fig. 2.19 to 2.22 Thin section photomicrographs of Grey Gneiss and granitoids.	32
Fig. 2.23 Map of the study area with stereonets for various transects.	33
Fig. 3.1 Map of the study area with new and published U-Pb ages.	38
Fig. 3.2 U-Pb data on standards run during the LA-ICP-MS sessions.	40
Fig. 3.3 Field photographs of samples locailites.	43
Fig. 3.4 Field photographs of samples locailites.	44
Fig. 3.5 U-Pb concordia for SA3-02 and SA8-45.	47
Fig. 3.6 U-Pb concordia for SA7-04 and SA7-86.	48
Fig. 3.7 U-Pb concordia for SA7-58, SA7-130 and SA7-91.	49
Fig. 3.8 U-Pb concordia for SA3-60, SA3-04 and SA3-01.	50
Fig. 3.9 U-Pb concordia for SA8-69.	51
Fig. 3.10 Effect of reverse discordance and lead-loss on U-Pb systematics.	56
Fig. 3.11 Compilation of new and published ages for the Suldal Sector.	57
Fig. 4.1 Map of the study area showing the sample localities.	64
Fig. 4.2 Geochemical classification of magmatic suites using QAP, $Sr/Y$ vs. Y, Fe* vs. SiO <sub>2</sub> , MALI vs. SiO <sub>2</sub> , ASI vs. SiO <sub>2</sub> and Na+K vs. SiO <sub>2</sub> .	3. 66
Fig. 4.3 Major element oxides vs. SiO <sub>2</sub> for magmatic suites in the Suldal Sector.	67
Fig. 4.4 Trace elements vs. $SiO_2$ for magmatic suites in the Suldal Sector.	68
Fig. 4.5 Trace and rare-earth-elements vs. $SiO_2$ for magmatic suites in the Suldal Sector.	69

Fig. 4.6 Primitive mantle normalised spider plots for magmatic suites in the Suldal Sector.	70
Fig. 4.7 Chondrite normalised spider plots for magmatic suites in the Suldal Sector.	71
Fig. 4.8 Rayleigh fractional crystallisation modelling of REE contents in the Grey Gneiss.	76
Fig. 4.9 SiO <sub>2</sub> vs. FeO <sup>t</sup> /MgO for selected continental arc and continental rifts compared with the Sauda Grey Gneiss.	79
Fig. 4.10 $SiO_2$ vs. Fe* for the Sauda Grey Gneiss and Amphibolite suites compared with natural and experimental data.	81
Fig. 4.11 Tectonic/petrogenetic model for ~1.5 Ga magmatism in the Suldal Sector, along with comparison of basalt geochemistry in different suites.	84
Fig. 5.1 Map of the study area showing sample localities with Hf-O results.	90
Fig. 5.2 CL images of selected zircons analysed for Hf-O.	91
Fig. 5.3 Compilation of secondary standard Hf isotope data.	94
Fig. 5.4 Compilation of primary standard oxygen isotope data.	95
Fig. 5.5 Results of in-situ Hf isotope analyses.	97
Fig. 5.6 Results of in-situ oxygen isotope analyses.	98
Fig. 5.7 Time corrected Hf isotope data for new and published data from 1.5 Ga and older units within SW Fennoscandia.	99
Fig. 5.8 Hf vs. O bulk-mixing modelling.	103
Fig. 6.1 Map of southern Norway showing the various Sveconorwegian granitoid suites.	109
Fig. 6.2 Map showing the sample localities.	112
Fig. 6.3 Geochemical classification plots for granitoid suites, using QAP, $SiO_2 vs. ASI$ , $SiO_2 vs. Fe^*$ and $SiO_2 vs. MALI$ .	114
Fig. 6.4 Major element oxides vs. SiO <sub>2</sub> for granitoid suites.	115
Fig. 6.5 Trace elements vs. $SiO_2$ for granitoid suites.	116
Fig. 6.6 Trace and rare-earth-elements vs. SiO <sub>2</sub> for granitoid suites.	117
Fig. 6.7 Primitive mantle normalised spider plots for granitoid suites.	118
Fig. 6.8 M vs. Zr with zircon saturation temperature isotherms for granitoid suites.	118
Fig. 6.9 Results of in-situ Hf isotope analyses.	119
Fig. 6.10 Results of in-situ oxygen isotope analyses.	120
Fig. 6.11 Time corrected Hf isotope data for new and published data from Sveconorwegian units within SW Fennoscandia.	121
Fig. $6.12 \text{ SiO}_2 \text{ vs.}$ Zr for plutons within southwest Norway, highlighting fractional crystallisation vs. magma mixing models.	122

Fig. 6.13 Petrogenetic model for formation of various Sveconorwgeian granitoid suites.	126
Fig. 6.14 Hf vs. O bulk-mixing modelling.	128
Fig. 7.1 Map of SW Fennoscandia showing 'interorogenic' units.	134
Fig. 7.2 Map of the Telemark supracrustals showing the sample locality.	135
Fig. 7.3 Stratigraphy of supracrustal belts within Telemarkia.	135
Fig. 7.4 U-Pb concordia for the Fjellhovdane rhyolite.	136
Fig. 7.5 Primitive mantle normalised spider plot comparing the Fjellhovdane and Trossovdal rhyolites with basement gneisses in the Suldal Sector.	137
Fig. 8.1 Geological map of the southern Norwegian Caledonides and the sample localities in the Hardangervidda-Ryfylke Nappe Complex.	141
Fig. 8.2 Tectonostratigraphy of the Hardangervidda-Ryfylke Nappe Complex.	142
Fig. 8.3 Field photographs of sample localities.	145
Fig. 8.4 Thin section photomicrographs of sampled units.	146
Fig. 8.5 Results of U-Pb dating with selected zircon images.	150
Fig. 8.6 Time corrected Hf isotope data compared with fields for autochthonous basement units.	152
Fig. 8.7 Primitive mantle normalised spider plot comparing the Dyrskard unit with the 1260 Ma Trossovdal rhyolite and with Sveconorwegian Feda suite granitoids.	154
Fig. 8.8 Cumulative probability plots for the Kvitenut and Revsegg units compared with a compilation of ages from the autochthonous basement, and a compilation of ages from other nappe complexes within the Scandinavian Caledonides.	157
Fig. 8.9 Postulated provenance of the Middle Allochthon units	158
Fig. 9.1 Strike-slip terrane displacement model for SW Fennoscandia.	163
Fig. 9.2 Compilation of detrital U-Pb zircon data for SW Fennoscandia.	164
Fig. 9.3 Retreating accretionary orogen model.	166
Fig. 9.4 Tectonic model for the Palaeo- to Mesoproterozoic evolution of Fennoscandia.	170
Fig. 9.5 Tectonic model for the Sveconorwegian evolution of SW Fennoscandia.	171
Fig. 9.6 Compilation of Hf data for SW Fennoscandia with interpretaed phases of compression and extension, and compilation of U-Pb data to compare inheritance in different domains.	176
Fig. 9.7 1.8-1.0 Ga crustal provinces in Laurentia and Fennoscandia.	178
Fig. 9.8 Postulated reconstruction of the ~1.8 Ga Nuna supercontinent.	182

## List of tables

3.1 – Summary of results from U-Pb dating	62
4.1 – Results of fractional crystallisation modelling	87
5.1 – Summary sample descriptions	92
8.1 - Compilation of ages for figure 8.8	159
10.1 – Precision and LLD for XRF (University of Leicester)	187
10.2 – Sample details	188
10.3 – Whole-rock geochemistry	201
10.4 – LA-ICP-MS U-Pb data	221
10.5 – Hafnium isotope data	232
10.6 - Oxygen isotope data – chapter 5	246
10.7 - Oxygen isotope data – chapter 6	248
10.8 – U-Pb (TIMS) data for chapter 3	254

### Introduction

### **1.1 Background and rationale**

This thesis is essentially a regional geological study, and one that aims to determine the geological evolution of the continental crust that forms southwest Norway. However, a number of 'themes' form subtle undertones throughout this work; in their broadest context these are: how, when and where was the continental crust formed? More specifically, it is the relative amount of new continental addition versus recycling of previously formed crust, that forms the strongest theme within this thesis. Particularly focussed on is crustal growth versus recycling within accretionary orogens; crustal growth in this particular setting has been well-studied in modern examples, but has not until recently been applied to the whole Earth history (Cawood et al. 2009).

#### **1.1.1 Topical aspects**

How and when the continental crust form and the rate of its production over time are fundamental questions in Earth Science. Answering these questions however has proved difficult, for example the last four decades have seen continued debate over whether the volume of continental crust has remained essentially unchanged since the early Archaean (e.g. Armstrong 1968, 1981), or whether the volume of crust has grown through time (e.g. Moorbath 1978; O'Nions et al. 1979). A key feature in this debate, is the apparent episodicity of crust formation (or juvenile mantle addition to the crust); such episodicity was recognised some 50 years ago (Gastil 1960), but the origin of apparent rapid continental growth periods is still debated today (e.g. Belousova et al. 2009; Condie et al. 2009; Iizuka et al. 2010).

Proxies for the continental growth record such as U-Pb crystallisation ages of juvenile granitoids, and Hf model ages derived from detrital zircons, all feature a certain element of episodicity, with peaks in individual datasets often overlapping (Figure 1.1); these global peaks in crustal production have been used to constrain models of supercontinent and superplume formation, and the link between these two planetary processes (Condie 2002; Li & Zhong 2009). However, it is poorly understood as to how much the peaks in the continental growth record result from actual increases in the production of continental crust, or result from preservational bias (Hawkesworth et al. 2009; Bahlburg et al. 2009).

Recent estimates on growth and recycling at modern plate margins suggest that the global rates of removal of continental crust are similar to the rates of its generation at magmatic arcs (Scholl & von Huene 2007, 2009; Clift et al. 2009). This leads to the inference that the current volume of continental crust may have existed since 2 to 3 Ga (Hawkesworth et al. 2010). To establish the role

of preservational bias in producing the apparent peaks in crustal growth, it is useful to determine a record of when and where continental crust was added and recycled for each continent, and then compare these to obtain a global record. The timing and extent of continental growth within Fennoscandia will be discussed within this thesis.



Figure 1.1. Compilation of mineral ages (Gastil 1960), compared with ages of juvenile crust (based on Condie 2005), compared with a compilation of U-Pb ages of detrital zircons (based on Campbell & Allen 2008). Grey bars show the timing of supercontinent formation. Note the episodicity of all three compilations, and the correlation with supercontinent formation. Modified after Hawkesworth et al. (2009).

Convergent margins are complex systems, with various parameters such as the thickness of crust, rate of convergence, angle of convergence, and the width of subduction zone, (e.g. Schellart 2008; Schellart et al. 2008), all impacting on the relative amount of continental growth (i.e. mantle addition) versus continental recycling (i.e. subduction erosion, sediment subduction). Although determining such parameters for ancient subduction zones is fairly unfeasible, general geodynamic settings can be postulated using geochronological and geochemical data. The geodynamic setting of studied magmatic suites is thus discussed in this thesis, with the aim of both constraining the tectonic evolution of the region, and determining the tectonic settings which favour continental growth over continental recycling.

#### **1.1.2 Regional aspects**

Proterozoic terranes are exposed over large areas of the continents; crystallisation age compilations of these terranes show peaks at 1.9 and 1.2 Ga (Condie 1998), and the average age of the upper crust determined from Sm-Nd is 2.0 Ga (Miller et al. 1986). Therefore, the Proterozoic is an important time period to study crustal growth. The good correlation of palaeotectonics between the Baltic Shield and other continents, e.g. Laurentia and Amazonia (Karlstrom et al. 2001; Johansson 2009), makes it an ideal location to study Proterozoic crustal growth.

The Fennoscandian Shield (referred to here as Fennoscandia and often referred to as Baltica by previous authors) is thought to involve southwesterly growth and accretion of continental crust, with an Archaean core in the northeast and Mesoproterozoic terranes in the southwest (e.g. Gaál & Gorbatschev 1987). This study focuses on the furthest southwest and what was traditionally thought of as the youngest terrane within the shield, known previously as the Rogaland Vest-Agder sector (Berthelsen 1980), and more recently informally termed the Hardangervidda, Suldal and Rogaland Sectors of the Telemarkia terrane (Bingen et al. 2005b).

Parts of the Rogaland Sector have been relatively well studied as the area is host to the Rogaland Igneous Complex, which comprises a large anorthosite-mangerite-charnockite (AMC) suite. The Suldal and Hardangervidda sectors are relatively poorly studied however, with the oldest gneissic basement not having a known age until recently (Bingen et al. 2005b).

The idea that Fennoscandia grew by sequential accretion of terranes to the west and southwest has been argued against based on data that suggest older crust may exist in the Telemarkia terrane (e.g. Ragnhildsvet et al. 1994). Also, the existence of possible crustal sutures within SW Fennoscandia (Cornell & Austin Hegardt 2004), has lead others to infer that Telemarkia is an exotic addition to Fennoscandia that wasn't accreted till the Sveconorwegian orogen. These arguments formed the initial reason to conduct this study into the poorly known parts of southwest Norway, and they form a topic which is repeatedly discussed within this thesis.

### **1.2** Aims

Following on from the topical and regional aspects outlined above, the general aims of this study are outlined here:

Using U-Pb geochronology to constrain the timing of tectonothermal events in the Suldal Sector, SW Norway.

Using petrography and whole-rock geochemistry to determine the petrogenesis and tectonic setting of igneous basement rocks in the Suldal Sector.

Using in-situ isotope geochemistry to determine the contribution of mantle material to magmatic events.

Using U-Pb geochronology, isotope and whole-rock geochemistry, assess whether crystalline rocks within Caledonian nappe units correlate with exposed basement that they overlie, and/or with Caledonian nappes elsewhere in Scandinavia.

Using the results collectively, test and develop tectonic models for the Proterozoic geological evolution of southwest Scandinavia.

### 1.3 Outline

Chapters 2 to 8 form separate entitities, each with their own introduction and conclusions; repetition of methods and geological background is kept to a minimum. The reader should refer to Chapter 2 for a regional geological context and background information on the study area. Chapter 9 presents a synthesis of previous findings, as well as new data and ideas on relevant topics.

Chapter 2 presents the geological setting for further chapters, with a brief introduction to the regional geology, and a description of the study area's geology; the latter includes a summary of the field-based and petrographical findings.

Chapter 3 presents a U-Pb geochronological study of basement rocks within the Suldal Sector, using both LA-ICP-MS and TIMS methods. The use of a chemical abrasion method combined with laser-ablation geochronology to produce precise Precambrian U-Pb ages is investigated.

Chapter 4 presents whole-rock geochemistry of the Telemarkian (~1500 Ma) basement rocks in the Suldal Sector, and discusses the petrogeneses of magmatic suites of this age.

Chapter 5 presents hafnium and oxygen isotope analyses measured in-situ in zircons from Telemarkian age gneisses. The data are used to further elucidate the petrogenesis these rocks, and discuss their tectono-magmatic setting in relation to the evolution of the Fennoscandian continent.

Chapter 6 presents whole-rock geochemistry and in-situ hafnium and oxygen isotopes for Sveconorwegian (~1.07-0.93 Ga) rocks from the Suldal Sector; the data are used to constrain the petrogeneses and geodynamic setting of the different granitoid suites.

Chapter 7 presents a LA-ICP-MS U-Pb age for a metarhyolite from a supracrustal belt in the Telemark Sector that has not been previously dated. The origin of this supacrustal belt (Grossæ-Totak) and other 'interorogenic' (~1.45-1.15 Ga) units within SW Fennoscandia is discussed.

Chapter 8 presents a study of the age and provenance of the Caledonian nappe units found within the Suldal Sector (known as the Hardangervidda-Ryfylke Nappe Complex), using LA-ICP-MS U-Pb geochronology and in-situ hafnium isotope analyses.

Chapter 9 presents a synthesis of the conclusions determined in all of the previous chapters. An overview of the tectonic history of the Fennoscandian Shield is presented which combines previous models with the new findings discussed in this thesis. A discussion of continental growth is presented, and is centred around the model of a retreating accretionary orogen. The growth of SW Fennoscandia is also discussed in relation to global tectonics and continental evolution.

### **1.4 Presentations**

Parts of this thesis have been presented as the following presentations:

'SW Fennoscandia in the formation and break-up of Rodinia (1): 1.8 - 1.0 Ga crustal growth and Sveconorwegian reworking.' (Poster), *N. M. W. Roberts, T. Slagstad, M. Marker*, Rodinia Fermor Metting 2009, Edinburgh.

'SW Fennoscandia in the formation and break-up of Rodinia (2): insights from the Hardangervidda-Ryfylke Nappe System.' (Poster), *N. M. W. Roberts*, Rodninia Fermor Metting 2009, Edinburgh.

'Proterozoic crustal growth in SW Fennoscandia' (Poster), *Nick M W Roberts*, Goldschmidt 2009, Davos.

'Proterozoic crustal growth in SW Fennoscandia' (Talk), *Nick M W Roberts*, Crustal Evolution Janet Watson Meeting 2009, London.

'Mesoproterozoic crustal evolution of southwest Norway; 1.5 Ga arc magmatism in Telemarkia.' (Talk), *Nick Roberts, Tim Brewer (decd.)*, 33<sup>rd</sup> IGC 2008, Oslo.

<sup>c</sup>Mesoproterozoic crustal evolution of southwest Norway) (Poster), *Nick Roberts, Tim Brewer (decd.)*, Geocchemistry Group AGM 2008, London. U-Pb data that is cited in chapters 5 and 6 was presented as:

'Mesoproterozoic growth, rifting, drifting and continental collision in Rogaland, SW Sveconorwegian province' (Poster), *Slagstad, T., Marker, M. and Skår, Ø.*, 33<sup>rd</sup> IGC 2008, Oslo.

### **1.5 Data sources**

All data was collected by the author, except for a proportion of the whole-rock geochemistry in chapters 3 and 6, which was acquired by Trond Slagstad and Mogens Marker for the Norwegian Geological Survey (NGU), and some of the U-Pb data used in chapters 5 and 6, which was acquired by Trond Slagstad and Mogens Marker on the Nordsim instrument at Stockholm. Also, some samples were collected by Tim Brewer, these have been re-analysed by the author. Some of the hafnium and oxygen isotope data was acquired on zircons already dated by Trond Slagstad and Mogens Marker. The interpretation of geochemical data obtained from NGU, and the interpretation of hafnium and oxygen isotope data obtained on zircons not belonging to the author, including all interpretations and conclusions. Supervisors and collaborators did provide some general discussion on data quality, preliminary data interpretation, and the form and presentation of the thesis.

### The geology of the Suldal Sector, southwest Norway

### 2.1 Regional Geology

Fennoscandia is the northwest part of the East European Craton, and comprises an Archaean craton in the northeast, mantled by successively younging geological domains to the southwest (Gaál & Gorbatschev 1987). Southern Norway and southwestern Sweden comprise the Southwest Scandinavian Domain (SSD), which was reworked during the Sveconorwegian orogeny (1.15-0.9 Ga). Crustal growth of this domain has been attributed to Gothian (1.75-1.55 Ga; Gaál & Gorbatschev 1987) and Telemarkian (1.52-1.48 Ga; Bingen et al. 2005b, 2008a) events. During the Sveconorwegian orogeny, lithospheric-scale shear zones are inferred to have displaced crustal domains (Park et al. 1991; Romer 1996; Stephens et al. 1996; Bingen et al. 2001b, Andersen et al. 2002b) so that the pre-Sveconorwegian configuration of the continent is enigmatic.

The SSD is bound by the Transcandinavian Igneous Belt to the east, and by Caledonian nappes to the north, and has been split into lithotectonic domains which young from east to west. The Transcandinavian Igneous Belt (TIB) is a composite belt of igneous rocks that trends NNW-SSE through southern Sweden to the NW Norwegian coast. The belt is dominated by coarse-grained porphyritic granitoids. TIB magmatism is split into two episodes, TIB 1 (1.81-1.77 Ga) and TIB 2/3 (1.72-1.66 Ga; Åhäll & Larson 2000), with TIB 1 intruding Svecofennian crust and TIB 2/3 intruding TIB 1 crust (Åhäll & Connelly 2008). The tectonic setting of the belt has been debated but is generally considered to be related to subduction converging in a NE/E direction (see Högdahl et al. 2004). Andersen et al. (2009a) propose that the voluminous granitoids were produced by anatectic melting of juvenile Svecofennian crust, with voluminous deep crustal mafic intrusions acting as a heat source.

The Eastern Segment (or Kläralven-Aträn terrane) lies to the west of the TIB belt, but is considered to be an extension of the younger TIB 2/3 magmatic belt that has been reworked prior to and during the Sveconorwegian orogeny (Connelly et al. 1996; Söderlund et al. 1999). The Protogine Zone marks the boundary between reworked and relatively undeformed TIB crust, and is a zone of both Gothian and Sveconorwegian deformation (Larson et al. 1990).

The Idefjorden domain lies to the west of the Eastern Segment. The domain comprises gneisses and granitoids of Gothian and Sveconorwegian age, as well as units not found in other terranes within the SSD, e.g. 1.38-1.30 Ga granitoids (Åhäll et al. 1997; Austin Hegardt et al. 2007). Growth of the Idefjorden crust occurred in the Gothian by continental arc magmatism and accretion of island and back-arcs (Brewer et al. 1998; Åhäll & Connelly 2008). The arc-crust of the Idefjorden domain may have formed proximal to the Fennoscandian continent along the same subduction margin that formed the TIB 2/3 crust (e.g. Åhäll & Connelly 2008), or may represent an allochthonous crustal

domain that was accreted to the Fennoscandian craton during the Sveconorwegian (Cornell & Austin Hegardt 2004). The Mylonite Zone that divides the Idefjorden and Eastern Segment is a zone of Sveconorwegian deformation, related to early thrusting of the Idefjorden domain over the Eastern Segment, and later exhumation of the Eastern Segment via east-west extension (Söderlund 1999).



Figure 2.1. Map of the East European Craton, Precambrian domains within Fennoscandia and terranes within the Southwest Scandinavian Domain. After Bogdanova et al. 2008; Bingen et al. 2008a.

The Bamble and Kongsberg blocks are grouped together by Bingen et al. (2005b), who consider them to be a collision zone between the Telemarkia and the Idefjorden domains. The Bamble and Kongsberg domains both include gneiss and granitoids units similar in age and composition to the Telemarkia and Idefjorden terranes that bound them (Åhäll & Connelly 2008; Andersen et al. 2002b; Bingen et al. 2005b), i.e. subduction-related arc plutonics and volcanics of Hisingen age (1.59-1.52 Ga; Åhäll & Connelly 2008). Metasedimentary units within the domain were deposited between the Telemarkian and Sveconorwegian periods (de Haas et al. 1999, 2002; Bingen et al. 2001; Åhäll et al. 1998; Knudsen et al. 1997).

The crust west of the Bamble-Kongsberg domain has been grouped into a single terrane (Telemarkia; Bingen et al. 2005b) that comprises four sectors; the Telemark Sector in the east, and the Rogaland, Suldal and Hardangervidda Sectors in the west. The latter three forming the Hardangervidda-Rogaland Block of Andersen et al. (2005), or the Rogaland-Vest-Agder Sector of Berthelsen (1980).

The Telemark Sector features a >10km thick succession of supracrustals comprising the 1.5->1.35 Ga Vestfjorddalen, and 1.16-1.10 Ga Sveconorwegian Supergroups (Laajoki et al. 2002). The Vestfjordallen Supergroup comprises the bimodal 1.51 Ga Rjukan Group and the overlying sedimentary Vindeggan Group..Bimodal magmatism is related to continental extension that occurred inboard of a subduction zone in a setting similar to the Granite-Rhyolite provinces in the mid-continental US (Slagstad et al. 2009). The Vemork Formation that is part of the Rjukan Group is dominated by metabasalt units; an intercalated metavolcanite is dated at  $1495 \pm 2$  Ma (Laajoki & Corfu 2007). The 5km thick Vindeggan grous comprised mostly of quartz-rich strata; a crosscutting diabase intrusion dated at 1347 ± 4 Ma (Corfu & Laajoki 2008) places a minimum age constraint on sedimentary deposition within the group. The Sveconorwegian Supergroup comprises bimodal volcanic and sedimentary sequences deposited between 1.17 and 1.12 Ga (Laajoki et al. 2002; Bingen et al. 2003), that formed in extensional basins inboard of a continental arc (Brewer et al. 2004), or in a Basin and Range setting (Bingen et al. 2003). Intrusions in the Telemark Sector include 1.19-1.13 Ga A-type plutons (Bingen et al. 2003), and a 1.03 Ga suite transitional between calc-alkaline and A-type (Bingen & van Breemen, 1998). The Setesdal region is host to the oldest crust recognised in Telemark, the Asen tonalite (1555  $\pm$  29 Ma; Pedersen et al. 2009). The main group of gneisses in the Setesdal region have ages of 1.32-1.22 Ga (Pedersen et al. 2009). At 1.2-1.2 Ga, juvenile granitoids intruded the gneisses in the Setesdal region; in the Vråvatn Complex in central Telemark, juvenile magmatism is dated at ~1.2 Ga (Andersen et al. 2007b; Pedersen et al. 2009).

In the Hardangervidda Sector (Figure 2.1) a gneiss complex comprises metasediments interlayered with granitic gneisses, the latter has been dated at ~1.65 Ga (Ragnhildsvet et al. 1994). A quartzofeldspathic gneiss yields a bimodal distribution of zircon ages, initially interpreted as gneiss crystallisation at 1.67 Ga and migmatisation at 1.47 Ga (Sigmond et al. 2000), and later interpreted as a paragneiss unit (Bingen et al. 2005b). Detrital zircon populations from metasediments in the area include Archaean to Mesoproterozoic components, with deposition constrained to later than 1.54 Ga (Bingen et al. 2001).

The geology of the Suldal Sector (Figure 2.1) can be divided into two parts, the 'basement' and the autochthonous/allochthonous nappes of Caledonian age. The basement was originally divided into three parts, supracrustal belts, a gneiss complex, and igneous intrusions; with the latter being both older and younger than the supracrustals (Sigmond 1978). All of these rocks formed in three



Chapter 2 – Geology of the Suldal Sector

Figure 2.2. Geological map of SW Fennoscandia, (see Figure 3.1 for study area).

separate Proterozoic events. The gneiss complex, most supracrustals and many of the intrusions are dated between 1540 and 1480 Ma (Bingen et al. 2005b; Slagstad et al. 2008). One supracrustal belt, Sæsvatn-Valldall, is younger and formed at 1260-1210 Ma (Bingen et al. 2002; Brewer et al. 2004).

A few granitoid intrusions within the sector have Sveconorwegian ages (Andersen et al. 2002a, 2007a; Bingen et al. 2005b; Slagstad et al. 2008).

Supracrustal rocks in the Suldal Sector have been mapped as three belts: Grjotdokki-Nesflaten, Suldal-Åkrafjord and Sæsvatn-Valldall (Sigmond 1978). The Grjotdokki-Nesflaten belt has not been directly dated, but surrounding conformable gneiss dated at 1499  $\pm$  12 Ma, lead Bingen et al. (2005b) to interpret a ~1500 Ma age for the belt. Deformed porphyritic granodiorite gneiss lenses that occur in the Suldal-Åkrafjord belt are dated at 1497  $\pm$  12 and 1496  $\pm$ 12 Ma (Bingen et al. 2005b); the age of volcanism in this belt is thus also interpreted to be ~1500 Ma. The Sæsvatn-Valldall belt has a metarhyolite at its base dated at 1259  $\pm$  2Ma (Brewer et al. 2004), and a sandstone at its top that is younger than 1211  $\pm$  18 Ma (based on the oldest dated zircon grain; Bingen et al. 2002). The belt formed in a marginal continental setting (Bingen et al. 2002), probably in a back-arc environment (Brewer et al. 2004).

The Rogaland Sector (Figure 2.1) comprises similar Telemarkian (1.52-1.48 Ga) rocks to those found in the Suldal Sector. Metasedimentary units are commonly interleaved with orthogneisses in the Rogaland Sector (Slagstad & Marker pers. comm. 2008), whereas they are rare in the Suldal and Hardangervidda Sectors. Concordant and deformed amphibolitic sheets found within the Rogaland gneisses have a Large-Ion-Lithophile-Element enriched N-MORB type signature (Slagstad & Marker pers. comm. 2008), are interpreted to have formed in an ocean-forming rifting event prior to the Sveconorwegian collision (Slagstad et al. 2008). The ~1500 Ma gneisses in the Rogaland Sector are typically migmatitic and highly deformed; less-deformed gneisses and granitoids are also found within the sector which are ~1200-1220 Ma in age (Slagstad et al. 2008).

The Sirdal Zone (Slagstad et al. 2008) is a broad region dominated by porphyritic granitoids and leucogranites, including the 1050 Ma Feda suite (Bingen et al. 1993; Bingen & van Breemen 1998). The granitoids may have an origin as an active continental margin that existed just prior to Sveconorwegian collision (Bingen & Van Breemen 1998; Slagstad et al. 2008), or an origin from partial melting of pre-existing crust with an arc signature as a consequence of crustal thickening during the Sveconorwegian orogeny (Bingen et al. 2008c). The Sirdal Zone may have formed from the partial subduction of the Rogaland Sector under the Suldal Sector during the early stages of the Sveconorwegian orogeny (Slagstad et al. 2008).

Late-Sveconorwegian (i.e. post-collisional/post-kinematic) granites intrude all of the Sectors. A broad region of granite plutons extends north to south and parallel to the Mandal-Ustaoset Line that divides the Telemark Sector from the Hardangervidda-Suldal-Rogaland Sectors. This alignment has been related to granite plutonism along lithospheric weaknesses that formed during the Sveconorwegian orogeny (Bogaerts et al. 2003; Duchesne et al. 1999). The ~930 Ma Rogaland anorthosite complex (Schärer et al. 1996) is the youngest of the late-Sveconorwegian intrusions in the region.

The Suldal and Hardangervidda Sectors are overlain by the Hardangervidda-Ryfykle Nappe Complex (Andresen & Færseth 1982; see Chapter 7), which was thrust onto the basement during the Caledonian orogeny (e.g. Gee et al. 1975). The deformation of the basement related to this orogeny is minimal and limited to a zone (<10m) of weak shearing only seen in some places. Together the nappes and basement have been weakly folded into large open folds (Sigmond 1978).

Within the Suldal sector, metamorphism has been dated by the Re-Os method on Cu-Mo mineral occurrences (Stein & Bingen 2002), with rocks from the Sæsvatn-Valldall belt recording various stages of metamorphism and deformation: onset of greenschist facies metamorphism and deformation at 1047  $\pm$  2 Ma, peak ductile deformation at 1032  $\pm$  2 Ma, incipient extension/relaxation at 1025  $\pm$  2 Ma and full relaxation (and brittle deformation) at 1017  $\pm$  2 Ma (Stein & Bingen 2002). Within the RVA sector, high-grade metamorphism has been attributed to the intrusion of the Rogaland Igneous Complex (Tobi et al. 1985), it has now been shown that highgrade metamorphism occurred prior to the intrusion, and a UHT overprint was locally induced due to contact metamorphism from the igneous complex (Möller et al. 2002). Within the UHT isograd surrounding the Rogaland Igneous Complex, zircon growths believed to be metamorphic reveal high-grade metamorphism at 1000 Ma (M1), ultra-high grade metamorphism at 930 Ma (M2), and later high-grade metamorphism related to M2 at 910 Ma (M3) (Möller et al. 2002, 2003). Re-Os dating of molybdenite records granulite-facies metamorphism at  $973 \pm 4$  Ma, that probably resulted from regional decompression towards the end of a prolonged period of metamorphism (1.03-0.97 Ga) (Bingen & Stein 2003). The origin of regional/local metamorphism and structural deformation outside of the area affected by the Rogaland Igneous Complex, is not constrained, but has been postulated to be Sveconorwegian in age (Bingen, cited in Bingen et al. 2005b).

### 2.2 Geology of the Suldal Sector

#### 2.2.1 Description of units

The basement rocks (that are assumed to be 1540-1480 Ma in age) are predominantly grey orthogneisses that are variably deformed and recrystallised, and likely represent mid-crustal to supracrustal igneous protoliths. Primary contacts and igneous structures have been obscured by the deformation and recrystallisation, such that a lithostratigraphy and chronology of events is difficult to elucidate.

As stated above, the original mapping defined three separate supracrustal belts; however, banded fine-grained gneisses interpretable as supracrustal rocks outcrop throughout most of the Sector. The discrimination of the Suldal-Akrafjord belt as a separate unit is therefore abandoned; although, one sequence of banded fine-grained rocks that outcrops east of Sauda is distinguished as a separate unit. This belt, referred to here as the Zinc Mine Banded Gneiss, forms a coherent block of banded and layered gneisses that have a single structural fabric, and is bound by undeformed granites and

Caledonian nappes. A few samples were taken from the Grjotdokki-Nesflaten belt in the Nesflaten area, the term 'Nesflaten Suite' is used when referring to this study area.

#### Sauda Grey Gneiss

The term Sauda Grey Gneiss (referred to as Grey Gneiss) refers to the bulk of the crystalline basement rocks, except for undeformed to weakly deformed granitoids that are assumed to be Sveconorwegian in age, the Zinc Mine Banded Gneiss and Nesflaten Suites, and the amphibolite suite. The Grey Gneiss is a heterogeneous complex of orthogneisses, comprising gabbro, diorite, granodiorite and tonalite compositions, along with minor granite-syenite. The complex is dominated by fine to medium-grained porphyritic grey gneisses. Some outcrops feature banding, commonly between aphyric and phyric units, likely representing volcanic tuff/ignimbrite/lava (i.e. supracrustal) layers. Medium-grained porphyritic gneisses likely represent hypabyssal/upper crustal intrusions. Gneisses with evidence for a non-igneous epiclastic origin (i.e. paragneiss) were not observed.

Sauda Grey Gneiss orthogneisses comprise plagioclase, biotite, amphibole and varying quartz contents, with minor K-feldspar in more silicic compositions. Accessory phases include abundant titanite which commonly forms coronas around ilmenite, apatite, epidote in the more mafic lithologies, and zircon in the more evolved lithologies. The amphibole is a hornblende in more pristine samples, but is commonly retrogressed to actinolite. Alteration of feldspar to sericite is widespread in most samples and biotite is commonly altered to chlorite.

Enclaves are common within the grey gneisses, and are of variable lithologies. The most common are fine-grained mafic to felsic xenoliths within granodioritic gneisses, but also displayed are tonalitic/granitic enclaves in more mafic units, often interpretable as disaggregated veins/dykes. Some outcrops include evidence of magma mingling, the best example of this comprises aphyric granodioritic gneiss mingling with aphyric dioritic gneiss; margins between the two lithologies are rounded. Partial melting within the Grey Gneiss is evident in some outcrops, usually without large-scale separation of leucosome and melanosome. In a few outcrops, leucosomes of tonalitic material have formed a network of cm- scale veins which are normally sub-parallel to the structural fabric. A few outcrops of fine-grained banded gneiss exhibit patch-leucosome formation, with new growth of hornblende within the leucosomes.

#### Zinc Mine Banded Gneiss

The Zine Mine Banded Gneiss (ZMBG) is a succession of fine to medium-grained banded gneisses that outcrop in the valley east of the town of Sauda. Compositions range from basalt to rhyolite, but the suite is dominated by dacitic to rhyolitic compositions. The gneisses are commonly porphyrytic with <10mm size phenocrysts of K-feldspar and quartz, in thin-section these are often aggregates of both quartz and feldspar. Interlayered and conformable with fine-grained gneisses are a few 10cm's

to <50m layers of coarse porphyritic granodiorite (augen gneisses). These are interpreted as hypabyssal intrusions which are likely to be comagmatic with the surrounding gneisses. The mineralogy of the ZMBG is comparable to that of the Sauda Grey Gneiss.



Figure 2.3. Field photographs of Sauda Grey Gneiss outcrops



Figure 2.4. Field photographs of various amphibolite outcrops

### Nesflaten Suite

The Nesflaten Suite comprises gneisses ranging from basalt to rhyolite in composition. Outcrops of gneiss with fine (<10cm) alternations of mafic and felsic compositions exist, as do mica-rich quartz-feldspar layers; some of these may have epiclastic origins. As well as abundant hornblende and

plagioclase, garnet and staurolite are recorded from one unit. Exposures of the belt in the north display networks of white granite/pegmatite intruding the gneiss complex; these are likely connected to a Sveconorwegian pluton.



Figure 2.5. Field photographs of the Grey Gneiss, Zinc Mine Banded Gneiss and Nesflaten Suite.



Figure 2.6. Field photographs of various outcrops of the Storlivatnet pluton

#### **Amphibolites**

Numerous mafic bodies that are metamorphosed to metabasites/amphibolites are found within the gneisses and granitoids; this suite is separated from the Grey Gneiss on rather subjective grounds, the separation is largely based on field-relations. Lithologies that are true amphibolites, or are more felsic but rich in amphibole and grade into more mafic lithologies, or are mafic enclaves within other lithologies, are grouped as the amphibolite suite. Undeformed dykes that have straight-

margins and intrude all other suites are not included in this suite. However, some dykes/sills crosscut the fabric in the grey gneiss but are weakly deformed themselves, and these are included. Undeformed to weakly deformed gabbroic bodies are common, these are commonly heterogeneous



Figure 2.7. Aggregates of polygonal amphibole surrounded by plagioclase-rich matrix, aggregates likely replaced larger phenocrysts of olivine and pyroxene. Plagiclase is heavily altered to sericite. (Amphibolites- Medium-grained layered amphibolite - SA7-50)



Figure 2.9. Subidioblastic amphibole grain with corona that contains fine-grained Fe-Ti oxide grians. Matrix is dominated by seritised feldspar. (*Amphibolites- Medium-grained layered amphibolite - SA7-50*)



Figure 2.11. Elongate poikiloblastic amphibole grains that are subparallel to the fabric. Matrix is composed of finer-grained quartz and altered biotite and feldspar.

(Sauda Grey Gneiss - Medium-grained hornblende-phyric granodiorite gneiss, SA7-115)



Figure 2.8. Patch of chlorite (centre) replacing biotite grains, relatively coarse anhedral Fe-Ti oxide grains, and polygonal amphibole grains.

(Amphibolites- Medium-grained layered amphibolite - SA7-50)



Figure 2.10. Subidiomorphic elongate amphibole grains forming a fabric with quartz and altered feldspar grains. Small rounded apatite grains can be seen in some ampibole grains. (Sauda Grey Gneiss - Fine-grained aphyric diorite gneiss, SA7-77)



Figure 2.12. Elongate subidiomorhic biotite and amphibole grains, with small idiomorphic titanite grains forming a band that is parallel to the fabric and biotite cleavage (centre). (Amphibolites- Medium-grained amphibolitic gneiss, SA7-114)

bodies, ranging from coarse-grained plagioclase-porphyritic diorites to fine-grained massive gabbro, often with a network of narrow (<10cm) leucosome veins running through them. Southwest of the town of Sauda, there is a layered gabbro body. The rhythmic layering is nearly flat-lying, repeats every 10-15cm's and comprises retrogressed hornblende at the base, grading into plagioclase at the



Figure 2.13. Poikiloblastic hornblende grain with straight margins and well-developed triple-junctions with plagioclase and quartz grains (e.g. black circle).

(Nesflaten - Medium-grained aphyric diorite gneiss, 375910, 6608495)



Figure 2.15. Subidiomorhic garnet grains along with xenoblastic biotite and a quartz-feldspar matrix. Sericite grains are visible, forming after feldspar.

(Zinc Mine Suite - Fine-grained aphyric felsic gneiss, SA3-63)



Figure 2.17. Subidiomorphic garnet grains along with subidioblastic hornblende and biotite grains. Feldspar is relatively unaltered. (Nesflaten - Medium-grained aphyric micarich quartz-feldspar schist, 378082, 6614677)



Figure 2.14. Xenoblastic biotite and hornblende with chlorite forming after biotite (top centre). Feldspars are heavily altered to sericite. Small apatite grains can be seen in the mafic minerals. *(Amphibolites - Coarse-grained amphibolite SA3-49)* 



Figure 2.16. Xenoblastic garnet grain along with minor fine-grained biotite and epidote. Original twinning can be seen in plagioclase grains. Quartz extinction is undulose (black circle).

(Zinc Mine Suite - Medium-grained aphyric granodioritic gneiss, SA3-67)



Figure 2.18. Elongate biotite laths forming a fabric which is bent around an augen composed of sericitised feldspar grains. (Sauda Grey Gneiss - Medium-grained porphyritic

(Sauda Grey Gneiss - Medium-grained porphyritic granodiorite gneiss, adjacent to SA3-42)

top. The layered body is intruded by an undeformed 1-2m wide tonalitic dyke, and within the surrounding area is disaggregated by more granitic material. The tonalite comprises plagioclase, quartz and biotite, with retrogression to sericite, epidote and chlorite. It appears to be the same composition as the top of the rhythmic gabbro layers, thus, the tonalite is interpreted to be a



Figure 2.19. Calcite veins within large deformed mesoperthite grain. (Sauda Grey Gneiss- Deformed feldspar-phyric granodiorite gneiss - SA3-04)



Figure 2.20. Large anhedral biotite and titanite grains forming a restitic clot. Pseudohexagonal apatite grains are visible in the mafic minerals. Coarse biotite grains are rimmed with finer biotite, epidote and titnaite grains.

(Sveconorwegian intrusion - Undeformed porphyritic biotite granite, SA3-01)



Figure 2.21. Deformed biotite grain surrounded by finer biotite grains (top right), altered and twinned plagioclase (left of centre), surrounded by perthitic feldspar, and quartz grain with undulose extinction (bottom right). *(Sveconorwegian intrusion - Undeformed porphyritic biotite granite, SA3-01)* 



Figure 2.22. Myrmeckite development (left of centre) on edge of K-feldpar, anhedral titanite grain (right of centre), and chlorite after biotite (top right). (Sveconorwegian intrusion - Undeformed porphyritic biotite granite, SA7-80)

comagmatic back-veining feature which occurred in a brittle environment. Deformed within the grey gneiss and porphyritic granitoids are numerous mafic enclaves. These comprise biotite and amphibole with minor plagioclase and quartz, and resemble the mafic units within supracrustal belts. The age of the amphibolites is generally unconstrained. The tonalitic dyke that intrudes the layered gabbro is ~1500 Ma in age (see Chapter 3), thus, this gabbro is part of the ~1500 Ma magmatic event, or potentially could be older.

#### Granitoids

Weak to moderately deformed coarse-grained porphyritic granodiorites occur as sheets within the Grey Gneiss complex, ranging from metres to tens of metres in width. These are conformable to the

fabric of the Grey Gneiss, and generally have graded boundaries into the Grey Gneiss lithologies. Undeformed bodies of porphyritic granite also occur; these have varying mafic content, grading from porphyritic biotite-hornblende granodiorites to porphyritic biotite granites, and probably represent zoned plutonic bodies. The distinction between ~1500 Ma plutonic bodies and those of Sveconorwegian age is unclear, as both deformed and undeformed examples of each exist. Bodies of leucogranite occur also, generally in association with porphyritic granites. Again the age of these is problematic, as both ~1500 Ma and ~1050 Ma examples have been dated (Slagstad et al. 2008).

#### 2.2.2 Structure

The Sauda Grey Gneiss Complex contains a structural fabric which has variable imprint across the region. The strongest deformation is recorded by proto-mylonitic banded units; phenocrysts within these are stretched but do not record an interpretable sense of shear. The majority of the outcrops record a sub-vertical L-fabric. Strain-shadow formation may have been strong during the main deformation phase, because undeformed outcrops occur adjacent to highly deformed outcrops. Within single lithologies, strain localisation into cm's and 10cm's scale is common. The boundaries between different lithologies are diffuse due to recrystallisation and the variable strain. The complex nature of the outcrops probably reflects multiple phases of intrusions, which in turn have intruded and deformed supracrustal units.



Figure 2.23. Map of the study area with lower-hemisphere stereonets showing planes and lineations (black spots), arrows define the transect that the structural data were obtained from for each plot.

The dominant strike trend is NW-SE (see Figure 2.23); although fold closures were not seen in the field, the main regional structure is that of tight to isoclinal folding with sub-vertical fold axis that trend NW-SE. Lineations dip to the southeast predominantly, suggesting stretching along the NW-SE fold-axis, and also that the fold-axis may be dipping to the southeast. A broad zone of strong shear that occurs to the southwest of Saudafjord (SHEARZONE in Figure 2.23) has a strike perpendicular (NE-SW) to the regional strike trend. Within both the ZMBG and Nesflaten Suite, a strong sub-vertical S-fabric is penetrative in a NNE-SSW direction, and phenocrysts are commonly stretched into augen.

The age and origin of deformation within the region is not constrained, but is generally considered to be Sveconorwegian (Bingen et al. 2005b). The complex nature of many outcrops is probably related to intrusion-related deformation during the main magmatic event (i.e. inferred to be Telemarkian ~1500 Ma). The regional NW-SE strike trend must be younger than the ~1500 Ma magmatic episode, because it effects all of the units except for the undeformed granite plutons; thus, this strike direction likely formed in relation to regional Sveconorwegian deformation and metamorphism (see next section), but this has yet to be demonstrated. The broad NW-SE strike direction is compatible with compression in a NE-SW direction, as would be expected with Sveconorwegian collision with an indentor from the SW. However, the Sveconorwegian collision may have been oblique (Park et al. 1991; Romer 1996; Stephens et al. 1996; Bingen et al. 2001), in which case the dominant strike trend may reflect strain partioning in a transpressional regime. The dominant strike direction in the Hardangervidda Sector is E-W (Sigmond 1998), suggesting there may be more complexity to the regional structures than determined and discussed here.

#### 2.2.3 Metamorphism (summary)

The petrography of orthogneisses from the Grey Gneiss, Zinc Mine Banded Gneiss and Nesflaten Suite, indicates widespread regional metamorphism that peaked at amphibolite-facies (see figures 2.7 to 2.22) No examples of retrogression from granulite-facies are observed, and also, no relic igneous pyroxenes or olivines are observed. In some lithologies actinolite and epidote are the peak-metamorphic minerals, indicating lower-amphibolite-facies has been reached; in other examples hornblende and garnet are preserved, suggesting middle-amphibolite-facies. Retrogression from hornblende to actinolite is observed, as is retrogression from biotite to chlorite. Alteration of feldspars to sericite and sausserite is widespread. Veins are commonly quartz dominated, but occassionaly calcite filled. Metamorphic amphibole and plagioclase commonly are fabric-forming, suggesting peak metamorphism was likely synchronous with regional deformation. Metamorphic aureoles relating to undeformed granitoids were not observed.

### 2.3 Conclusions

The basement in the Suldal Sector is dominated by orthogneisses that are assumed to be 1540-1480 Ma in age (Bingen et al. 2005b; Slagstad et al. 2008); based on their petrology, petrography and

intrusive-relations, they are interpreted as mid- to upper-crustal, hypabyssal and supracrustal igneous rocks, intercalated together during multiple periods of intrusive activity during evolution of a mature volcanic arc. This arc complex was intruded by composite granitoid plutons during the Sveconorwegian orogeny. Mafic intrusions are related to the main arc event, but also cross-cut interpreted Telemarkian structures, and occasionally cross-cut Sveconorwegian granitoids. Metamorphism and regional deformation likely occurred (but this is not yet demonstrated) during the main collisional phase of the Sveconorwegian orogeny, with the undeformed granitoids intruding during a later phase of the orogeny. Some structures probably also formed during the Telemarkian arc event, as multiple phases of intrusion would lead to complex cross-cutting relations. The regional peak-metamorphic grade reached was middle-amphibolite-facies; retrogression to lower-amphibolite and upper-greenschist facies is common. Partial melting is observed in many outcrops, attesting to relatively high-temperatures. Leucosomes are commonly sub-parallel to the fabric, suggesting this partial melting may have been facilitated by shear deformation. Such partial melting and synchronous regional deformation are observed in other midcrustal gneiss complexes, including those that formed during the same orogenic period (e.g. Muskoka domain of the Laurentian Grenville Province; Slagstad et al. 2005).

## A chemical abrasion LA-ICP-MS and ID-TIMS U-Pb study of Mesoproterozoic magmatism in the Suldal Sector; constraints on Telemarkian and Sveconorwegian crustal evolution

**Aim** - In this Chapter U-Pb zircon ages using LA-ICP-MS are presented for gneisses and granitoids from the Suldal Sector; TIMS analyses are presented for a selection of the dated rocks to compare the precision and accuracy of the methods. The applicability of a chemical abrasion zircon treatment is assessed for use with the LA-ICP-MS method.

### 3.1 Introduction

In U-Pb geochronology, the Isotope Dilution Thermal Ionisation Mass Spectrometry (ID-TIMS) method has long been recognised as producing the highest level of precision. Using an ion probe (Secondary Ion Mass Spectrometry – SIMS) however, can give much greater levels of resolution, as individual growth zones of minerals can be targeted with the ion beam. Although being the most precise, TIMS analyses are also the most costly; SIMS analyses are also costly, but less so than TIMS. The recent advances in Laser Ablation Inductively Coupled Mass Spectrometry (LA-ICP-MS) has lead to a vast increase in the number of U-Pb analyses being achieved globally, partly because laser ablation systems can be coupled to already existing ICP-MS machines. This latter method is less costly than TIMS and SIMS and produces a greater number of results per machine time. The spatial resolution capabilities using LA-ICP-MS are greater than using TIMS, since the beam can be aimed at specific growth zones, but is typically less resolute than SIMS due to a greater beam diameter. The precision of LA-ICP-MS in reported U-Pb ages is variable, but is much less than that of TIMS and typically similar to that of SIMS. Some users regard LA-ICP-MS as more of a reconnaissance tool, and is useful for guiding further work prior to more precise TIMS analyses; the method has seen its greatest U-Pb based use in detrital zircon studies, and is also commonly used in Precambrian studies where high-precision is not always necessary. However, the overall precision typically reached (~1%) is up to a factor of 10 worse than ID-TIMS. A goal in LA-ICP-MS U-Pb geochronology is to improve analytical protocols that achieve precision on U-Pb ages that more closely approach the precision of ID-TIMS, and that result in a high proportion of concordant analyses.

The chemical abrasion method (Mattinson 2005) is now routinely used in TIMS U-Pb zircon geochronology to produce concordant populations that will give a precise age. Variably discordant data are one factor that limits the overall precision of LA-ICP-MS geochronology; this study assesses the use of chemical abrasion for increasing the precision in this method.
# 3.2 Geological Framework

Samples were taken from the Suldal Sector, SW Norway (see Chapter 2). A range of lithologies with a variety of deformation states were sampled in order to help constrain tectonothermal events in the region. Previous U-Pb studies suggest that much of the exposed basement formed in the period from 1520 to 1480 Ma (Bingen et al. 2005b; Slagstad et al. 2008). However, many of the ages obtained are imprecise (>  $\pm 10$  Ma), meaning that a relative chronology of events within the region is difficult to establish. Sampled units included the Zinc Mine Banded Gneiss (Figure 3.1); concordant porphyritic lenses within this sequence are dated at 1497  $\pm$  12 and 1496  $\pm$ 12 Ma (Bingen et al. 2005b). The Nesflaten Suite is also targeted; this belt has not been previously dated, but conformable and surrounding gneiss gives an age of 1499  $\pm$  12 Ma (Bingen et al. 2005b). Within the Sauda Grey Gneiss Complex (Figure 3.1), amphibolite, granodioritic and granitic gneisses were sampled. Deformed and undeformed coarse-grained granitoids that were expected to give Sveconorwegian ages were also targeted; previously published ages exist for granitoids of 1065  $\pm$  75 and 1018  $\pm$  33 (Bingen et al. 2005b). Sample locations for previous U-Pb determinations are shown in figure 3.1.

## 3.3 Methodology

U-Pb geochronology was determined on zircons by laser ablation multi-collector inductively coupled plasma mass spectrometry (LA-MC-ICP-MS), with a subset of samples being dated also by isotope dilution thermal ionisation mass spectrometry (ID-TIMS); both at the NERC Isotope Geosciences Laboratory, Nottingham.

Zircons were separated from coarsely crushed whole-rock samples using the following techniques, disk-milling, sieving to remove the >300  $\mu$ m fraction, Wilfley water table seperation, heavy liquid separation, and finally Frantz magnetic separation. Zircons from the non-magnetic fraction were picked under alcohol; for LA-ICP-MS, zircons were mounted in 1 inch diameter epoxy resin mounts and polished to expose an equatorial section through the grains. A fraction of each sample was chemically abraded prior to mounting to remove portions of grains that have undergone lead loss (Mattinson 2005). For the chemical abrasion, a bulk zircon fraction from each sample was annealed in a muffle furnace at 850°C for 60 hours in a quartz beaker with a loose-fitting lid. The zircon crystals were washed in warm 4N HNO<sub>3</sub>, and rinsed in ultra-pure water to remove surface contamination. The annealed and cleaned bulk zircon fraction was then chemically abraded in ~200  $\mu$ l 29N HF and ~20  $\mu$ l 8N HNO<sub>3</sub> at 120°C for 12 hours. The abraded fraction was then washed several times in ultra-pure water, washed in warm 3N HCl for several hours on a hot plate, and then rinsed again in ultra-pure water and 8N HNO<sub>3</sub> before picking. A few analyses were conducted on zircons that were not annealed or abraded, and were mounted on double-sided tape on a glass slide.



Figure 3.1. A) Geological sketchmap of the main geological provinces in the Fennoscandian Shield. B) Sketchmap of SW Fennoscandia showing the division of lithotectonic domains. C) Sketchmap showing the sample localities and new and previously published ages. Ha = Hardangervidda Sector, Su = Suldal Sector, RVA = Rogaland Vest-Agder Sector, TIB = Transcandinavian Igneous Belt, MUSZ = Mandal-Ustaoset Shear Zone, KPSZ = Kristiansand-Porsgrunn Shear Zone, SSSZ = Saggrenda-Sokna Shear Zone, VSZ = Vardefjell Shear Zone,  $\emptyset BZ = \emptyset$ stfold Marstrand Boundary Zone, SFDZ = Sveconorwegian Frontal Deformation Zone, PZ = Protogine Zone (modified from Bingen et al. 2005b). Errors on ages are quoted at  $2\sigma$ . Grid co-ordinates are zone 32V UTM.

For LA-MC-ICP-MS, the procedures were similar to those outlined in Horstwood et al. (2003). The analyses used a Nu Plasma HR multi-collector inductively coupled plasma mass spectrometer (MC-ICP-MS), coupled to a 193 nm solid state (UP193SS, New Wave Research) Nd:YAG laser ablation system, and an in-house designed low volume 'zircon ablation cell' based on the design principles

of Bleiner & Gunther (2001). Helium gas was introduced to the ablation cell to transport the ablated sample material. Solutions were aspirated using a Nu Instruments DSN-100 de-solvating nebulizer using an ESI PFA-50 nebuliser.

The counting array involved measurement of <sup>238</sup>U, <sup>235</sup>U, <sup>205</sup>Pb/Tl, <sup>203</sup>Pb, and <sup>202</sup>Hg on Faraday cups, and <sup>207</sup>Pb, <sup>206</sup>Pb, and <sup>204</sup>Pb/Hg on discrete dynode ion-counting detectors. Tuning of the MC-ICP-MS at the start of each analytical session was achieved with the aspiration of a 500ppt solution of <sup>205</sup>Tl-<sup>235</sup>U. Ion counter to-Faraday gains were determined using a 100ppt <sup>205</sup>Tl-<sup>235</sup>U solution by jumping the <sup>205</sup>Tl peak through each ion counter and comparing the equivalent Faraday signal. During the ablation analyses a <sup>205</sup>Tl/<sup>235</sup>U solution was simultaneously aspirated, this allows for an improved correction of instrumental mass bias and plasma induced inter-element fractionation. The isobaric interference of <sup>204</sup>Hg on <sup>204</sup>Pb was corrected by simultaneous measurement of <sup>202</sup>Hg (assuming <sup>204/202</sup>Hg = 0.229887).

Large rasters are preferred to static spots, as these limit the amount of fractionation at the ablation site (Horstwood et al. 2003); however, the zircon fragments used in this study were relatively small and thus limited the size of raster. In 2008, the analyses were conducted with a  $20\mu m x 20\mu m$  raster using a 15µm spot at a rate of 15µm per second. 12 passes of the raster gave 40 seconds of analysis time, a washout of 30 seconds was allowed in between each analysis. The laser was set to 70% power at 5Hz, giving a fluence averaging 4.5 J/cm<sup>3</sup>. In 2009, a 25µm spot and a 25µm x 25µm raster made with a 15µm spot were used; again at 15µm per second, meaning 8 passes gave 40 seconds of analysis. Instead of a 30 second washout, the laser was warmed-up for 15 seconds prior to opening the shutter. 70-80% power and 5Hz were used, giving an average fluence of 2 J/cm<sup>3</sup>.

Primary standards used were Plešovice (Sláma et al. 2008) in 2008, and 91500 (Wiedenbeck et al. 1995) in 2009. These matrix-matched primary standards were analysed at regular intervals during each analytical session. The deviation of the average daily <sup>207</sup>Pb/<sup>206</sup>Pb and <sup>206</sup>Pb/<sup>238</sup>U values of the primary standard compared to the true value were used to normalize the sample data. The latter corrects for inter-element fractionation, whilst the former corrects for any drift or offset in the ion-counter gains recorded previously. To take account of the errors associated with the normalization process, the reproducibility of the primary standard ratios is propagated into the uncertainty of the sample ratios. A combination of GJ-1 (Jackson et al. 2004), 91500 or Plešovice were used as secondary standards to monitor the precision and accuracy of each analytical session.

Data were reduced and errors propagated using an in-house spreadsheet calculation package, with ages determined using Isoplot 3 (Ludwig 2003). Analyses that recorded <<0.01mV <sup>207</sup>Pb were rejected, and those that recorded a <sup>204</sup>Pb signal of >300 cps were assessed for possible common-Pb contributions and rejected where required.

The average reproducibility of the  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  and  ${}^{206}\text{Pb}/{}^{238}\text{U}$  ratios on the primary standards was 0.65 and 0.99% respectively for 91500, and 0.79 and 1.00% for Plešovice (1 $\sigma$ ). The average reproducibility of the secondary standards, after normalization to the primary standard, was 0.74 and 1.22% for  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  and  ${}^{206}\text{Pb}/{}^{238}\text{U}$  respectively on GJ-1, and 0.56 and 1.40% for Plešovice. The secondary standards gave  ${}^{206}\text{Pb}/{}^{238}\text{U}$  ages of 602.02 ± 13.08 Ma (2 $\sigma$ ) for GJ-1 (accepted  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  age 609 Ma, but its  ${}^{206}\text{Pb}/{}^{238}\text{U}$  age is accepted as ~602-604 Ma due to its slight normal discordance; Jackson et al. 2004), and 339.54 ± 12.99 Ma for Plešovice (accepted age 337.13 Ma; Sláma et al. 2008); and are thus accurate within 1.2% (2 $\sigma$ ) (see Figure 3.4).



Figure 3.2. U-Pb data on standards run during the LA-ICP-MS analytical sessions.

For ID-TIMS analyses, zircons were subject to a modified version of the chemical abrasion technique (see previous section). After this treatment, the zircons were sequentially washed in dilute high purity HCl, HNO<sub>3</sub> and water prior to dissolution. Zircon was dissolved in Parr vessels in 120  $\mu$ l of 29 M HF with a trace of 30% HNO<sub>3</sub> at 210 °C for 48 h, dried to fluorides, and then redissolved in 6 M HCl at 180 °C overnight. U and Pb were separated using an HCl-based anion-exchange chromatographic procedure (Krogh 1973). Pb and U were loaded together on a single Re filament in a silica-gel/phosphoric acid mixture (Gerstenberger & Haase 1997). TIMS analyses utilised the EARTHTIME <sup>205</sup>Pb-<sup>233</sup>U-<sup>235</sup>U (ET535) tracer solution. Measurements were performed on a Thermo Triton TIMS. Lead analyses were measured in dynamic mode on a MassCom SEM detector and corrected for 0.16 ± 0.04% / a.m.u. mass fractionation. Linearity and dead-time corrections on the SEM were monitored using repeated analyses of NBS 982, NBS 981 and U500. Uranium was measured in static Faraday mode on 10<sup>11</sup> ohm resistors or for signal intensities < 15 mV, in dynamic mode on the SEM detector. Uranium was run as the oxide and corrected for

isobaric interferences with an  ${}^{18}\text{O}/{}^{16}\text{O}$  composition of 0.00205 (determined through direct measurement at NIGL).

Loading blanks were <0.1 pg Pb and total procedural blanks were <1.5 pg Pb and <0.1 pg U, respectively. U-Pb dates and uncertainties were calculated using the algorithms of Schmitz and Schoene (2007) and a <sup>235</sup>U/<sup>205</sup>Pb ratio for ET535 of 100.21  $\pm$  0.1%. All common Pb in the analyses was attributed to blank and subtracted based on the isotopic composition and associated uncertainties analysed over time. The <sup>206</sup>Pb/<sup>238</sup>U ratios and dates were corrected for initial <sup>230</sup>Th disequilibrium using a Th/U<sub>[magma]</sub> of 4  $\pm$  1 applying the algorithms of Crowley et al. (2007). All analytical uncertainties are calculated at the 95% confidence interval; all sources of uncertainty include the systematic error from tracer calibration and <sup>238</sup>U decay constant.

## **3.4 Sample Descriptions**

## 3.4.1 SA3-02 tonalite dyke (Sauda Grey Gneiss Complex)

SA3-02 is an undeformed tonalitic dyke that intrudes a rhythmically layered metagabbro. The sample comprises strained quartz, coarse-grained heavily sericitised plagioclase feldspar, fine-grained biotite retrogressed to chlorite, and epidote. Zircon, titanite and Fe-Ti oxides occur as accessory phases. The dyke is 1-2m wide and has straight-sided margins. A network of at least two sets of veins cross-cuts the metagabbro; these are the same material as the dyke. Magma-mingling textures, including rounded margins to gabbroic enclaves in the tonalitic material, suggest a back-veining origin to some or all of the tonalite. In this scenario, the tonalite may have originated as a highly evolved differentiate of the gabbro that has intruded into the gabbro during cooling. The straight-sides to the dyke suggest it intruded in a brittle deformation regime.

#### 3.4.2 SA8-45 banded felsic gneiss (Nesflaten Suite)

SA8-45 is a sheared banded fine to medium-grained felsic gneiss. The sample comprises aligned biotite laths, recrystallised quartz and variably sericitised feldspar. Titanite and zircon occur as accessory phases. The gneiss is taken from the Nesflaten Suite that outcrops around the northern extent of Suldalsvatnet. In the area, basaltic to dacitic fine-grained banded gneisses dominate, and generally feature a strong vertical fabric with weak shearing.

## 3.4.3 SA7-04 rhyodacitic gneiss (Zinc Mine Banded Gneiss)

SA7-04 is a sheared fine-grained grey gneiss with scattered phenocrysts of sericitised feldspar and ribbons of quartz. Fine-grained biotite lathes are unaltered and aligned with the fabric. Zircon occurs as an accessory phase. The gneiss is taken from the Zinc Mine Banded Gneiss, 1km from the granite SA3-01. The banded gneiss in this area is variable, comprising narrow mafic schists, and

dominated by phyric and aphyric granodioritic to granitic banded gneisses. The gneisses are sheared, and feature a vertical fabric.

#### 3.4.4 SA7-86 metagabbro (Amphibolite)

SA7-86 is an amphibolite from a coarse-grained pegmatitic clot (~1m diameter) in a metagabbro body. The sample comprises feldspar heavily altered to sericite and sausserite, hornblende partially retrogressed to actinolite, biotite retrogressed to chlorite, and epidote. Abundant titanite, zircon and a Fe-Ti oxide occur as accessory phases. The metagabbro body is a ~2km wide body within the Sauda Grey gneiss on the west side of Saudafjord, parts of the metagabbro feature narrow felsic leucosomal veins. Within this 20km stretch of outcropping gneisses, a number of metagabbro bodies exist, including the layered gabbro mentioned above. Due to deformation and recrystallisation these bodies grade into the granodioritic gneisses so that the intrusive relationships cannot be determined. The sampled pegmatitic clot is free from deformation.

#### 3.4.5 SA7-58 biotite porphyritic granite (Sveconorwegian intrusion)

SA7-58 is a coarse-grained porphyritic granite comprising perthite and plagioclase, variably altered to sericite, strained quartz, and finer-grained strained biotite and titanite. Fe-Ti oxides, allanite, apatite and zircon occur as accessory phases. The granite is very weakly deformed, and intrudes and cross-cuts sheared basaltic-rhyolitic bimodal banded gneisses (including SA7-130). In this area (south of Suldalsvatnet), a variety of porphyritic granites intrude the supracrustals and gneissic basement; these are inferred to be of Sveconorwegian age.

### 3.4.6 SA7-130 banded rhyodacitic gneiss (Sauda Grey Gneiss Complex)

SA7-130 is a fine-grained felsic gneiss comprising fine-grained equigranular granoblastic quartz and feldspar, and biotite laths aligned with the fabric. Concentrations of biotite and Fe-Ti oxide grains occur in weakly developed bands. Zircon and titanite occur as accessory phases. The banded gneiss is highly sheared and occurs with subordinate amphibolite layers, protoliths to the gneisses may have been bimodal volcanic tuffs, and thus the area was originally mapped as supracrustals (Sigmond 1975). Undeformed porphyritic granite (including SA7-58) intrudes the gneisses.

#### 3.4.7 SA7-91 biotite granite (Sauda Grey Gneiss Complex)

SA7-91 is an undeformed porphyritic granite, comprising medium to coarse-grained perthitic feldspar that is variably altered to sericite, surrounded by a fine-grained granoblastic quartz matrix. Altered biotite, epidote and Fe-Ti oxides occur together in the matrix. Zircon occurs as an accessory phase. The granite is a >2km wide body on the southern side of Åkrafjord. Margins of the granite were not seen. To the north of the granite, gabbro-granodiorite-granite gneisses similar to those around Saudafjord occur. An undeformed 3m wide mafic dyke cuts through the granite outcrop.



Figure 3.3. Field photographs of sample localities for U-Pb dating, SGGC = Sauda Grey Gneiss Complex; ZMBG = Zinc Mine Banded Gneiss.



Figure 3.4. Field photographs of sample localities for U-Pb dating.

#### 3.4.8 SA3-60 banded rhyolitic gneiss (Sauda Grey Gneiss Complex)

SA3-60 is a felsic gneiss comprising equigranular fine-grained quartz and sericitised feldspar with a slight granoblastic texture, and small clots and schlieren of Fe-Ti oxides, altered biotite and titanite. Apatite and zircon occur as accessory phases. The felsic gneiss is highly sheared and isoclinally folded, and may have originated as a banded rhyolite. The felsic gneiss occurs as a 20m wide zone within a heterogeneous outcrop of fine to medium grained diorite to granodioritic gneisses.

## 3.4.9 SA3-04 granodiorite gneiss (Sauda Grey Gneiss Complex)

SA3-04 is a sheared granodiorite gneiss exhibiting an augen texture. The sample comprises strained quartz, heavily serictised and sausseritised feldspar, deformed into ribbons and augen, surrounded by fine-grained quartz, feldspar, biotite, epidote and titanite. Zircon and rare apatite occur as accessory phases. The augen gneiss outcrops on the periphery of a 5km wide zone dominated by a high sense of shear; zones of proto-mylonite have formed commonly in the centre of this zone. The protoliths in this region likely included high-level porphyries, and both phyric and aphyric tuffs. Rare highly stretched xenoliths of mafic material occur in the sampled outcrop.

#### 3.4.10 SA3-01 biotite-hornblende porphyritic granite (Sveconorwegian intrusion)

SA3-01 is an undeformed coarse-grained feldspar-phyric granite with abundant glomerocrysts of hornblende, biotite and titanite. Accessory phases include zircon and apatite. SA3-01 is from a large (>50km<sup>2</sup>) pluton that intrudes the zinc-mine supracrustals on its western edge. The sample is taken from adjacent to the zinc mine, 200m from the boundary with the Zinc Mine Banded Gneiss; at the boundary zone xenoliths of the supracrustals can be seen in the granite.

#### 3.4.11 SA8-69 porphyritic granodiorite (Sveconorwegian intrusion)

SA8-69 is a granodiorite containing seriate-textured phenocrysts of feldspar (typically mesoperthite), quartz, hornblende and biotite. Apatite, zircon and abundant titanite occur as accessory phases. Alteration of feldspar to sericite is abundant. The sample is from a heterogeneous

outcrop comprising diorite/granodiorite gneisses and porphyries; the granite is folded and weakly sheared with finer-grained gneisses and felsic veins.

# 3.5 Results

The ages quoted are based on mean  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  ages of mainly concordant points, as opposed to mean  ${}^{206}\text{Pb}/{}^{238}\text{U}$  or concordia ages;  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  ages ages are the most appropriate for material of this age, and for data with a degree of discordance. The errors on the mean ages derived from LA-ICP-MS data are calculated using two standard deviations of the mean, as this does not have the effect of reducing the uncertainty in large populations. All errors are quoted at  $2\sigma$  unless stated.

#### **3.5.1** SA3-02 tonalite dyke (Sauda Grey Gneiss Complex)

## LA-ICP-MS:

Nine chemically abraded grains and seven non-abraded grains were analysed. The nine abraded analyses are reversely discordant (-1.2 to -4.4%) and provide a weighted mean average  ${}^{207}$ Pb/ ${}^{206}$ Pb age of 1513 ± 5 Ma (MSWD = 0.52). The seven non-abraded analyses are concordant to slightly reversely discordant (0 to -2.1%) and provide a weighted mean average  ${}^{207}$ Pb/ ${}^{206}$ Pb age of 1521 ± 5 Ma (MSWD = 0.87). The two mean  ${}^{207}$ Pb/ ${}^{206}$ Pb ages are in error of each other, but have a slight offset. The weighted mean  ${}^{207}$ Pb/ ${}^{206}$ Pb age of all fifteen analysis is 1516 ± 14 Ma (MSWD = 1.03). *TIMS:* 

Four analyses on chemically abraded grains are slightly discordant (0.2 to 1.4%), and provide a weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of 1511.1 ± 1.6 Ma (MSWD = 1.4; 95% conf.). Although reversely discordant, the chemically abraded grains analysed by LA-ICP-MS are closer in age to the TIMS analyses than the non-abraded grains.

## 3.5.2 SA8-45 banded felsic gneiss (Nesflaten Suite)

#### LA-ICP-MS:

Sixteen chemically abraded grains, and 8 non-abraded grains were analysed; both rasters and spots were used to compare each method. Of the spot analyses, 6 were chemically abraded grains and 6 were non-abraded grains. The chemically abraded grains were all reversely discordant, two of which to a large degree (-33.2 and -37.1%). The non-abraded grains were slightly reversely discordant (c. -2 to -6%), and two were normally discordant (+2.5 and +21.5%). The raster analyses have less discordance and less variation, being concordant to reversely discordant (0.2 to 12%), except for one grain that has normal discordance (5%) but is slightly older ( $^{207}$ Pb/ $^{206}$ Pb age of 1554 ± 14 Ma). Six grains were analysed by spots then rasters; 5 out of the 6 grains were more concordant when rasters were used. There is no offset in the mean  $^{207}$ Pb/ $^{206}$ Pb age between spots and rasters, both are 1519 Ma. A weighted mean  $^{207}$ Pb/ $^{206}$ Pb age using 18 analysis (including 2 rejected)

is given at  $1520 \pm 14$  Ma (MSWD = 1.06); this age is interpreted as the best estimate of crystallisation of the protolith to the gneiss.

## 3.5.3 SA7-04 rhyodacitic gneiss (Sauda Grey Gneiss Complex)

#### LA-ICP-MS:

Twentyone grains were analysed in total, 9 of these were rejected due to high common lead contents. 7 chemically abraded grains fall on concordia but with a spread of  $^{207}$ Pb/ $^{206}$ Pb ages from 1466 to 1531 Ma. 5 non-abraded grains are discordant (+3.2 to +27.2%), and give varying  $^{207}$ Pb/ $^{206}$ Pb ages; these are 1421 Ma (N=2), 1461 Ma, 1546 Ma, and 1620 Ma. The younger three grains when combined with the concordant grains fall on a regression line between 1493 ± 18 and 308 ± 160 Ma; if the 1535 Ma grain is included as well, then the regression gives an upper intercept of 1494 ± 25 Ma and a lower intercept of 176 ± 230 Ma. The 1620 Ma grain is interpreted to be an inherited grain; although the discordance of this analysis (16.4%) means that this age only gives an indication of the true age of the grain, it may be much older if non-zero Ma lead-loss events have affected the zircon. The spread in ages of concordant abraded grains may reflect a Proterozoic lead-loss event, or may reflect some inheritance of slightly older zircons with the true age being closer to 1470 Ma than the mean age, or may reflect a combination of both lead-loss and inheritance that cannot be distinguished with this dataset.

## TIMS:

Five analyses on abraded grains are discordant and fall on a regression line (MSWD = 8.8) that is similar to that given by the LA-ICP-MS analyses. The upper intercept of this regression at 1497  $\pm$  22 Ma overlaps the mean age of the concordant LA-ICP-MS analyses (1495 Ma). The lower intercept is imprecise (401  $\pm$  140 Ma) but may reflect a lead-loss event related to the Caledonian orogeny. The 1497 Ma age is interpreted to be the best estimate of the crystallisation age of the protolith of this gneiss.

## 3.5.4 SA7-86 metagabbro (Amphibolites)

#### LA-ICP-MS:

21 chemically abraded grains, 10 in the first analytical session, and 11 in the second were analysed. The 21 analyses provide a weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of 1508 ± 10 Ma (MSWD = 0.36). All of the analyses are slightly discordant (+1.1 to +4.5). The second analytical session had lower precision on the  $^{206}$ Pb/ $^{238}$ U ratio than the first, and the mean  $^{207}$ Pb/ $^{206}$ Pb ages of the two sessions are slightly different; the first session gave 1506.0 ± 4.1 Ma (MSWD = 0.43) and the second gave 1512.9 ± 7.5 Ma (MSWD = 0.047). Despite the offset, all of the analyses are in error of each other. *TIMS:* 

Five chemically abraded grains are concordant to slightly normally discordant, and don't give overlapping  $^{207}$ Pb/ $^{206}$ Pb ages. The weighted mean of the two most concordant grains is 1497.6 ± 1.5 (MSWD = 3.2), and is interpreted as the best estimate of the crystallization age of the metagabbro.



Figure 3.5. Results from U-Pb dating for SA3-02 and SA8-45. All errors are  $2\sigma$ . all weighted mean ages are  ${}^{207}Pb/{}^{206}Pb$ . Dashed white squares are raster ablation sites, and circles are spot sites.



SA7-04 rhyodacitic gneiss (Zinc Mine Banded Gneiss)

Figure 3.6. Results from U-Pb dating for SA7-04 and SA7-86. All errors are  $2\sigma$ . all weighted mean ages are <sup>207</sup>Pb/<sup>206</sup>Pb. Dashed white squares are raster ablation sites, and circles are spot sites.





SA7-91 biotite granite (Sauda Grey Gneiss Complex)



Figure 3.7. Results from U-Pb dating for SA7-58, SA7-130 and SA7-91. All errors are  $2\sigma$ . all weighted mean ages are  ${}^{207}Pb/{}^{206}Pb$ . Dashed white squares are raster ablation sites, and circles are spot sites.



SA3-60 banded rhyolitic gneiss (Sauda Grey Gneiss Complex)



SA3-04 granodiorite gneiss (Sauda Grey Gneiss Complex)





SA3-01 biotite-hornblende porphyritic granite (Sveconorwegian intrusion)



Figure 3.5. Results from U-Pb dating for SA3-60, SA3-04 and SA3-01. All errors are  $2\sigma$ . all weighted mean ages are  ${}^{207}Pb/{}^{206}Pb$ . Dashed white squares are raster ablation sites, and circles are spot sites.





Figure 3.9. Results from U-Pb dating for SA8-69. All errors are  $2\sigma$ . all weighted mean ages are  ${}^{207}Pb/{}^{206}Pb$ . Dashed white squares are raster ablation sites, and circles are spot sites.

Other <sup>207</sup>Pb/<sup>206</sup>Pb ages are 1494, 1500 and 1507 Ma; the oldest two of these may represent some inheritance of slightly older material during intrusion and crystallisation of the gabbroic body. Although inheritance (and zircon crystallisation in general) is typically low in mafic rocks, examples are documented such as those found in a mid-ocean ridge setting (Schwartz et al. 2005). The 1498 Ma age is interpreted as the best estimate of crystallisation of the amphibolites.

#### 3.5.5 SA7-58 biotite porphyritic granite (Sveconorwegian intrusion)

#### LA-ICP-MS:

9 analyses on non-abraded grains give a weighted mean  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  age of  $1068 \pm 30$  Ma (MSWD = 1.19). The  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  ages have a slight spread, ranging from 1048 to 1084 M; and the data have variable discordance (-3 to 6.9%).

## TIMS:

4 chemically abraded grains give a weighted mean  ${}^{207}$ Pb/ ${}^{206}$ Pb age of 1047 ± 1 Ma (MSWD = 0.074); the analyses are concordant to slightly normally discordant. 6 of the LA-ICP-MS just overlap (±2 $\sigma$ ) with the TIMS analyses, whereas 3 grains are older and don't overlap. Given that a similar granitoid from the same region (SA8-69) has an older 1068 Ma age (see Section 3.5.11); the spread in ages in this granite may represent zircon growth during a prolonged crystallisation and/or

multiple-phase intrusion of this composite pluton. The 1047 Ma TIMS age is interpreted as the best estimate of the age of crystallisation of this granite however.

## 3.5.6 SA7-130 banded rhyodacitic gneiss (Sauda Grey Gneiss Complex)

### LA-ICP-MS:

9 analyses on chemically abraded grains are fairly concordant (-1.3 to +1.2%), and give a weighted mean  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  age of 1503 ± 11 (MSWD = 1.8; error calculated using a constant external error for each data point of 20)

## TIMS:

8 chemically abraded grains give a regression with an upper intercept at  $1511 \pm 3$  Ma and a lower intercept at  $806 \pm 34$  Ma (MSWD = 2.1). The 8 analyses are variably normally discordant. The TIMS upper intercept age is interpreted as the best estimate of crystallisation of the protolith. The lower intercept although not falling at an exact Sveconorwegian age, may represent lead-loss during this orogenic period.

## 3.5.7 SA7-91 biotite granite (Sauda Grey Gneiss Complex)

### LA-ICP-MS:

10 chemically abraded grains were analysed. The analyses are slightly discordant (-0.7 to +2.9%), and give a weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of 1516 ± 15 Ma (MSWD = 0.64). *TIMS:* 

4 chemically abraded grains give a weighted mean  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  age of  $1503 \pm 1$  Ma (MSWD = 1.2). The analyses are concordant to slightly normally discordant. This TIMS age is interpreted as the best estimate of crystallisation of the granite.

## 3.5.8 SA3-60 banded rhyolitic gneiss (Sauda Grey Gneiss Complex)

## LA-ICP-MS:

10 chemically abraded grains, 7 in the first session, 3 in the second, and 4 non-abraded rim analyses were conducted. The chemically abraded analyses are fairly concordant (2.7 to -2.8% discordance), and give a weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of 1518 ± 13 Ma (MSWD = 0.47). The four rim analyses have large uncertainties ( $^{206}$ Pb/ $^{238}$ U ± ~3 to 9% 2 $\sigma$ ) and are discordant (21.6 to 1%), but have  $^{207}$ Pb/ $^{206}$ Pb ages overlapping those of the abraded grains. The upper intercept age of these four grains at ~1521 Ma and a lower intercept at ~0 Ma, suggests a lack of Precambrian lead-loss events affecting the zircon grains.

## 3.5.9 SA3-04 granodiorite gneiss (Sauda Grey Gneiss Complex)

#### LA-ICP-MS:

Eleven chemically abraded grains were analysed, along with nine non-abraded grains for rim analyses using tape-mounting. The eleven abraded grains provide a concordia age of  $1509 \pm 4$  Ma,

with all but one grain being concordant; the weighted mean  ${}^{207}Pb/{}^{206}Pb$  age is 1509 ± 14 Ma (MSWD = 0.54) One of the rim analyses was rejected due to high common lead, the other eight are imprecise, and have a large degree of normal discordance, but point towards an upper intercept at ~1509 Ma, and a lower intercept at zero. The rim data suggest no lead-loss events are recorded in the zircon grains. The 1509 Ma  ${}^{207}Pb/{}^{206}Pb$  age is interpreted to represent crystallisation of the porphyry.

# 3.5.10 SA3-01 biotite-hornblende porphyritic granite (Sveconorwegian intrusion)

#### LA-ICP-MS:

18 analyses were done in two sessions, 11 in the first and 7 in the second. All of the analysis are concordant to slightly discordant (less than 5%), and were conducted on chemically abraded grains. A weighted mean average  ${}^{207}$ Pb/ ${}^{206}$ Pb age is given by all 18 analyses of 1039 ± 15 Ma (MSWD = 0.26). No obviously inherited grains are recorded. Zircons are all oscillatory zoned with some discordance between zones visible on many grains. Central and outer zones have been analysed, but with no difference in age recorded. The discordant zoning likely represents replenishment of the cooling magma in combination with movement of the magma mush, but within the timeframe of analytical uncertainty (<15 Ma). The 1039 Ma age is interpreted as recording the crystallisation age of the granite.

#### **3.5.11** SA8-69 deformed porphyritic granodiorite (Sveconorwegian intrusion)

#### LA-ICP-MS:

14 analyses were conducted on 14 grains, 7 chemically abraded grains and 6 non-abraded grains. 6 out of the 7 abraded grains are concordant to slightly reversely discordant (-7.9 to +2%), and give a weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of 1064 ± 9 Ma (MSWD = 1.07). The rejected grain is discordant (+18.2%) and has a  $^{207}$ Pb/ $^{206}$ Pb age of 1339 Ma. 7 analyses on the 6 non-abraded grains are concordant to slightly normally discordant (-0.9 to +7.1%), and give a weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of 1070 ± 14 Ma (MSWD = 3; 95% conf.). The grain with both a core and outer growth-zone analysed gave an older age for the outer growth-zone (1095 ± 17 Ma) compared to the core (1051 ± 27 Ma); these ages are just in error of each other and indicate that the outer growth zone does not represent a younger magmatic/metamorphic growth. The weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of all the analyses (except the 1339 Ma grain) is 1069.3 ± 8.7 Ma (MSWD = 2; 95% conf.); this age is calculated using a constant external error, and is interpreted to be the best estimate of crystallisation of the granitoid.

## 3.6 Discussion

#### 3.6.1 Chemical abrasion for laser ablation studies

High-precision and high-accuracy U-Pb geochronology can be achieved more effectively with zircon data that lack discordance due to lead-loss. The chemical abrasion method (Mattinson 2005) removes domains which have lost lead, thus, residual zircon that is dated is considered to contain U-Pb systematics that have remained in a closed-system. Chemical abrasion involves two main steps, annealing with high temperatures and abrasion with strong acid at moderate temperatures. Annealing is undergone at temperatures of 800-1100°C, with the aim of removing low to moderate lattice damage from natural alpha, alpha recoil and spontaneous fission processes (Mattinson 2005). The method of annealing prior to chemical abrasion limits leaching effects that have been observed in previous studies (e.g. Mattinson 1997). Chemical abrasion following annealing can be achieved with one step or multi-step partial dissolution. During multi-step partial dissolution where the temperature is raised during each subsequent analysis, the steps typically remove zones with decreasing U+Th contents (Mattinson 2005). Previous to the combined annealing and abrading method, most laboratories used the 'air abrasion' method (Krogh, 1982), which removed outer zones of zircons which are typically more discordant; this method doesn't penetrate cracks and fractures in zircon grains however. Identifying inheritance in zircon grains may become more straightforward using the chemical abrasion method, as the effects of lead-loss are reduced (Mattinson 2005).

For ion microprobe and laser-ablation methods, annealing of radiation damage is considered to remove heterogeneities related to U-Pb fractionation during alpha recoil, as well as radiation damage, thus providing a more homogeneous zircon grain that will feature smoother sputtering during ablation. (Romer 2003; Mattinson 2005). Most LA-ICP-MS U-Pb analyses are routinely conducted on grains that are untreated, except perhaps for a clean in weak acid. The method employed here used a single step chemical abrasion (120°C for 12 hours in Hf and minor HNO<sub>3</sub>). For most samples, especially the older Telemarkian gneisses, this provided what can be described as an 'overkill' method, given that on average less than 5 to 10% of the original material was salvageable after chemical abrasion. For the undeformed granitoids where larger prismatic zircons were abraded, slightly more material was available after abrasion.

The results show that this single-step overkill method was successful in producing single populations of concordant material. Most of the LA-ICP-MS analyses fall into relatively tight groups with overlapping error ellipses. Where analyses were conducted in two different sessions on the same sample (e.g. SA7-86 and SA3-01), the offset between analyses in the different sessions highlights how reproducible the individual sessions were. Several of the samples gave analyses which were reversely discordant (e.g. SA3-02, SA8-45 and SA8-69). Reverse discordance is primarily produced by analytical artifacts, and only extremely rarely by natural processes. Where analyses were conducted on both untreated and abraded grains, the abraded grains were more reversely discordant. Also, in an example where both raster and spot analyses were conducted

(SA8-45), the spots gave greater reverse discordance than the rasters. Reverse discordance is only affecting the abraded grains, and is enhanced when using static spot analyses; this effect is therefore interpreted to represent a matrix-matching issue.

Inter-element fractionation is a major factor impacting on laser ablation analyses, Horn et al. (2000) showed that this fractionation can be related to the ablation pit depth, and is inversely exponentially correlated with spot size. A number of methods have been employed to limit such fractionation, such as rastering over large areas to limit pit depth (Horstwood et al. 2003), soft-ablation where laser power is increased slowly throughout the analyses (Hirata 1997), and active-focusing where the laser focus is changed throughout the analyses (Hirata & Nesbitt 1995). The method employed within this study was to use rasters, however, the small zircon sizes, especially after chemical abrasion, meant that rasters still involved 6 to 10 passes over the same area.

If the inter-element fractionation during analyses of the standard is similar to that of the unknowns, then the impact on the overall analyses will be limited. This is why zircon standards are used to normalize zircon unknowns (i.e. matrix-matching). Studies have shown however that the use of zircon standards for non-zircon unknowns such as monazite and titanite, can provide precise and accurate analyses if methods such as rastering are employed to reduce inter-element fractionation (Horstwood et al. 2006; Storey et al. 2006). The abraded zircon grains analysed within this study exhibited fractures, cracks and features that suggested they were rather skeletal. These features do exist in the large fragments of standard zircons (e.g. 91500). Thus, the matrix-matching effect is reduced. During analyses, ablation of more skeletal grains would lead to a greater degree of inter-element fractionation is interpreted to be the cause of reverse discordance. The worst case of reverse discordance (SA8-45) was achieved using zircons that exhibit the greatest amount of cracks, providing further evidence for the matrix-matching issue described.

Reverse discordance due to inter-element fractionation should occur directly away from 0 Ma leadloss. Real lead-loss on the other hand may have not occurred at 0 Ma. Therefore, the intercept of discordant analyses (i.e.  $^{207}$ Pb/ $^{206}$ Pb age), may not reflect the true age of the grain (see Figure 3.10). A difference in  $^{207}$ Pb/ $^{206}$ Pb age of the average of the untreated versus abraded grains is visible in SA3-02 (1521 ± 12 versus 1513 ± 10 Ma), and in SA8-69 (1070 ± 14 versus 1064 ± 9 Ma), and may reflect this effect. The accuracy of the final age is affected by this analytical artifact, and therefore need to be limited as much as possible.

The accuracy of some of the LA-ICP-MS ages determined in this study can be analysed by comparing with the TIMS ages. In five out of the six samples, the difference between the LA-ICP-MS and TIMS ages is less than 1% (0.27 to 0.86%). This overlap in ages can be viewed

qualitatively by observing the TIMS error ellipses falling within the LA-ICP-MS error ellipses in figures 3.5 to 3.7. In one example the difference between the two ages is closer to 2%; however, in this example (SA7-58) the LA-ICP-MS age is derived from a large spread in <sup>207</sup>Pb/<sup>206</sup>Pb ages, with older ages possibly representing inheritance of older material. Again, the TIMS ellipses fall within the majority of the error ellipses of the LA-ICP-MS analyses. The variation between mean <sup>207</sup>Pb/<sup>206</sup>Pb ages derived from chemically abraded and untreated grains where analysed, is also less than 1% for each sample (SA3-02, S8-45, SA8-69). The combined LA-ICP-MS and ID-TIMS study clearly shows that LA-ICP-MS analyses are accurate and in good agreement with reference values for both standards and unknowns as determined by accompanying ID-TIMS data.



Figure 3.10. U-Pb concordia plot, showing example of how analytical induced reverse discordance may effect a zircon which has non-zero lead-loss. A grain which was formed at 3500 Ma and exhibited lead-loss at 1500 Ma should fall on a tie-line between these two ages, but reverse discordance away from 0 Ma may push the grain onto concordia giving a spurious and meaningless age.

The overall precision on the LA-ICP-MS ages is equal or better than most published Precambrian ages on similar rocks that have been observed during review of the literature in this thesis; also the populations of zircons exhibit much less scatter throughout a suite of metaigneous samples than any observed in recent literature. In future, perhaps a less radical chemical abrasion step would be advisable, as this would leave zircon fragments which were larger, allowing for larger rasters, as well as less skeletal fragments which would limit inter-element fractionation issues. Analyses of untreated grains are also useful to check what effect the chemical abrasion has had in relation to non-zero lead-loss and inheritance.

#### 3.6.2 1.5 Ga Telemarkian crustal growth

From previous work, the crust within the Suldal Sector formed during the 1520-1480 Ma Telemarkian period (Bingen et al. 2005b). Combining the previously published ages with those in this study, the time-span for magmatism within this region is 1489 to 1520 Ma without errors included; including  $2\sigma$  errors the minimum time span is 1492 to 1509 Ma, whereas the maximum time span is 1475 to 1534 Ma. If unpublished ages from the Suldal Sector are included of 1475 ± 8, 1484 ± 10, 1486 ± 4 and 1521 ± 6 Ma (Slagstad & Marker 2009, unpublished data), then the maximum age range is slightly increased; but overall the 1520-1480 Ma age span of Bingen et al. (2005b) is fairly appropriate. This 40 million year age span is appropriate for a continental crust-building long-lived mature volcanic arc or active continental margin. Within this time frame the crust likely underwent phases of compression and extension, as these may occur in cycles of~10 million years in an accretionary orogen (Collins 2002).



Figure 3.11. Compilation of published ages (grey squares) and those determined in this study (black squares) from the Suldal Sector. Published ages are Bingen et al. (2005b). Error bars are 2sigma. Dashed lines mark the 1520-1480 Ma Telemarkian time span.

The hitherto undated Nesflaten Suite has an age of  $1520 \pm 14$  Ma, suggesting it formed in the earlier part of the Telemarkian period. The sample from the Zinc Mine Banded Gneiss did not yield a precise age, but the estimate provided here of  $1497 \pm 22$  Ma overlaps the previous ages on concordant porphyritic layers ( $1497 \pm 12$  and  $1496 \pm 12$  Ma; Bingen et al. 2005b). The Sauda Grey Gneiss yielded ages of  $1518 \pm 13$ ,  $1511 \pm 3$ ,  $1509 \pm 14$  and  $1503 \pm 1$  Ma; all of these ages fall in the earlier part of the Telemarkian period. The overlap between the Zinc Mine Banded Gneiss, Nesflaten Suite and Sauda Grey Gneiss agrees with the interpretation that the supracrustal belts defined by the earlier mapping (Suldal-Åkrafjord and Grjotdokki-Nesflaten; Sigmond 1978), do not form separate belts that lie upon an older gneissic basement, but are all part of the same event (see Chapter 2). The age of the metagabbro (SA7-86) at  $1498 \pm 2$  Ma confirms that this member of the 'amphibolite' suite (see Chapter 2) is part of the Telemarkian event. The  $1511 \pm 2$  Ma age for an undeformed tonalite dyke that intrudes a layered metagabbro suggests the gabbroic body (another member of the amphibolite suite), is of Telemarkian age, and also fairly early on in the Telemarkian period.

Undeformed units are dated at  $1511 \pm 2$  (SA3-02) and  $1503 \pm 1$  Ma (SA7-91), whereas deformed units are both older and younger than these ages. This suggests that deformation was not penetrative, but instead was partitioned, with certain units escaping either both Telemarkian and Sveconorwegian fabric-forming deformation. This means that a relative chronology based on structural fabrics is potentially misleading; such chronologies have been used in the past to help define tectonothermal events, for example in the Idefjorden terrane various granitoids were grouped based on their state of deformation (Åhäll et al. 1990). The use of structural fabrics in this way is advised against, given that strain can be highly localized over a range of scales.

In-situ U-Pb geochronological methods are useful for indentifying inheritance in magmatic suites since large zircon populations can be dated, and older cores that represent inherited zircons that have been overgrown can be analysed. About 350 zircons have now been analysed from Telemarkian rocks in the Suldal Sector. In this large population only one grain is outside of the error of the Telemarkian age span, this grain is discordant (+16.4%) and has a <sup>207</sup>Pb/<sup>206</sup>Pb age of 1620 Ma. The lack of inheritance in Telemarkian rocks suggests limited amounts of older material were available for inheritance, or that the magmas were capable of dissolving any inherited zircon (see discussion in Chapter 5). Some inheritance of Telemarkian age material during the prolonged Telemarkian event is suggested by the data, for example in SA7-86 precise TIMS <sup>207</sup>Pb/<sup>206</sup>Pb ages spread from 1507 to 1495 Ma, with 1498  $\pm$  2 Ma being the interpreted age of crystallisation. Cathodoluminescence images of the zircons (Figures 3.5 to 3.9), show that each sample comprises a population of zircons that have similar characteristics, which is compatible with their interpreted igneous origin. The zircons are mostly elongate and oscillatory zoned, and lack any obvious inherited cores or discontinuities. Zircons from SA7-86 are unzoned to weakly zoned and are fragments of larger zircons (>300  $\mu$ m), which is compatible with their interpreted crystallisation in a mafic composition.

## 3.6.3 Sveconorwegian events

The Sveconorwegian orogeny (e.g. Gaál & Gorbatschev, 1987; Bingen et al. 2008a) involved continent-continent collision between Fennoscandia and another continent of unknown origin. Sveconorwegian events within SW Fennoscandia have been split into four distinct phases (Bingen et al. 2008c). The Arendal phase (1140-1080 Ma) involved collision between the Telemarkia and Idefjorden terranes, and the thrusting of the Bamble-Kongsberg terrane over Telemarkia (Bingen et al. 2008c). The Agder phase (1050-980 Ma) represents the main continent-continent collisional

phase, with the collision possibly being oblique (Bingen et al. 2008c). Crustal thickening and associated regional metamorphism is estimated at have peaked at 1035 Ma (Bingen et al. 2008c).

Within the Suldal sector, metamorphism has been dated by the Re-Os method on Cu-Mo mineral occurrences (Stein & Bingen 2002), with the Sæsvatn belt recording various stages of metamorphism and deformation: onset of greenschist facies metamorphism and deformation at 1047  $\pm$  2 Ma, peak ductile deformation at 1032  $\pm$  2 Ma, incipient extension/relaxation at 1025  $\pm$  2 Ma and full relaxation (and brittle deformation) at 1017  $\pm$  2 Ma (Stein & Bingen 2002). Monazite analyses in a ~1500 Ma gneiss to the south of the Suldal Sector give a younger age of 1005  $\pm$  7 Ma, interpreted to represent amphibolites-facies metamorphism (Bingen et al. 2008b). A titanite age of 1009  $\pm$  10 Ma from the 1035 Ma Rosskreppfjord granitoid (Andersen et al. 2002a) provides further evidence for metamorphism of this age. From analyses of all available geochronological data, Bingen et al. (2008b) define M1 as regional medium-pressure protracted metamorphism that peaked in granulite-facies, and occurred from 1035 to 970 Ma. M2 peaked at 930-920 Ma and is related to intrusion of the Rogaland Anorthosite Complex, but did not affect the Suldal Sector (Bingen et al. 2008b). The crust in the Suldal sector is inferred to be in a brittle regime by 970 Ma, with regional decompression occurring from 970 to 955 Ma (Bingen et al. 2008b).

Separate rim analyses were conducted on two deformed units (SA3-60, SA3-04); for each of these samples the discordant rim analyses point towards lead-loss at ~0 Ma, suggesting there is no observable imprint from the Sveconorwegian orogeny on the U-Pb systematics. Only one sample (SA7-130) has an imprecise lower intercept that is near the range of the Sveconorwegian orogeny (at 806  $\pm$  34 Ma). This sample is highly deformed and some parts of the outcrop feature leucosome formation, however, the fabric and leucosomes are cross-cut by SA7-58 dated at 1047  $\pm$  1 Ma; this suggests that the 806 Ma age is unrelated to the deformation or partial melting of the sample. Overall, the imprint of the Sveconorwegian orogeny recorded in the Telemarkian basement in this U-Pb dataset is non-existent to minimal.

Four main magmatic suites are defined in Telemarkia that occur within the main Sveconorwegian orogenic period. These are the Feda Suite (~1050 Ma), Fennefoss Suite (~1035 Ma), Hornblende-Biotite Granite Suite (~970-930 Ma) and the Rogaland AMC Suite (~930 Ma) (Schärer et al. 1996; Bingen & van Breemen 1998; Andersen et al. 2002a, 2007a). The Feda Suite may have been produced in an active margin setting that existed just prior to continent-continent collision (Slagstad et al. 2008; Bingen & van Breemen 1998), or may represent melting of previous arc-related crust as a result of crustal thickening (Bingen et al. 2008c). The HBG Suite is considered to be post-collisional and likely formed via fractional crystallisation of mafic lower crust (Vander Auwera et al. 2003; 2003; Bogaerts et al. 2003, 2006; Bingen et al. 2006). The Rogaland AMC Suite intruded

contemporaneously with the latter stages of the HBG Suite, and likely formed from an anhydrous mafic lower crust (e.g. Longhi et al. 1999; Bolle et al. 2003).

This study has shown that a composite pluton, named here the Storlivatnet pluton, has ages of 1069  $\pm$  9 Ma, 1047  $\pm$  1, 1039  $\pm$  15 Ma (this study) and 1021  $\pm$  8 Ma (MM26181; Slagstad & Marker 2009, unpublished). The oldest age (~1069 Ma) is from a strongly deformed porphyritic granitoid. The next youngest ages of 1047 and 1039 Ma are from relatively undeformed porphyritic granitoids (although some undulose extinction is observed). Thus, it can be inferred that deformation of the oldest granitoid occurred after 1069  $\pm$  9 and prior to 1047  $\pm$  1 Ma. It is not known whether the deformation of this granitoid is related to the NW-SE striking fabric-forming deformation that effects much of the older Telemarkian crust; but the data suggest at least some deformation occurred early on and perhaps slightly older than the Agder phase (1050-980 Ma) of the Sveconorwegian orogeny in the Suldal Sector.

The oldest Sveconorwegian granitoids dated hitherto, are the Mandal-Svindal Unit (1051 + 2/8 Ma), Veggja-Leland Unit (1051 + 2/8 Ma) and the Liland Unit (1051 + 2/4 Ma), all belonging to the Feda Suite (Bingen & van Breemen 1998). The  $1069 \pm 9$  Ma age for the Storlivatnet pluton pushes back the recorded onset of Sveconorwegian magmatism by some 18 million years. Bingen et al. (2008c) suggest that the Feda Suite may have formed by melting of older crust due to crustal thickening. Crustal thickening is inferred to have peaked at 1035 Ma (Bingen et al. 2008b); however, for crustal thickening to have produced all of the early-Sveconorwegian granitoids it must have occurred as early as ~1070 Ma, for which there is no direct evidence of. An alternative explanation is that the early-Sveconorwegian magmatism was related to subduction along a continental arc that was active just prior to continent-continent collision; such an explanation has already been postulated for the Feda Suite (Bingen et al. 1993; Bingen & van Breemen 1998; Slagstad et al. 2008). The deformation that occurred between 1069 and 1047 Ma (see above) is compatible with magmatism in an arc setting (at 1069 Ma) prior to collision and deformation in the Suldal Sector (at <1069 >1047 Ma), and followed by crustal thickening (at ~1035 Ma; Bingen et al. 2008b).

The only other event in the region of comparable age to the 1069 Ma Storlivatnet granitoid is that of deposition of the Kalhovde Formation in the adjacent Telemark Sector (Bingen et al. 2003). The age of deposition of this unit is interpreted to be  $<1065 \pm 11$  Ma based on an average of the six youngest detrital grains (Bingen et al. 2003); although, the youngest individual grains have  $^{207}$ Pb/ $^{206}$ Pb ages at  $1035 \pm 31$ ,  $1054 \pm 11$ ,  $1059 \pm 19$  and  $1061 \pm 11$ . This unit likely formed in an extensional setting, interpreted to have during regional thermal subsidence following 1.17-1.14 Ga volcanism (Bingen et al. 2003). This setting is at odds with a model whereby crustal thickening has produced the entire early-Sveconorwegian magmatic suite. Thus, a subduction-zone setting is preferred for the early stages of Sveconorwegian magmatism (Feda Suite). Brewer et al. (2002) advocate a continental

back-arc setting for 1.17-1.13 Ga volcano-sedimentary units within the Telemark Sector, suggesting that subduction-margin processes occurred until at least 1.16 Ga in the region. A subduction origin for the early-Feda magmatism suggests the subduction-margin was active until ~1050 Ma, just prior to continent-continent collision. Further evidence for a subduction-zone setting at ~1060 Ma is discussed in Chapter 8.

# 3.7 Conclusions

11 new ages are presented for gneisses/granitoids within the Suldal Sector, southwest Norway. Three ages from a composite pluton (Storlivatnet) that has both deformed and undeformed lithologies gave  $1039 \pm 15$ ,  $1047 \pm 1$  and  $1069 \pm 9$  Ma, and therefore these ages extend the age range of early-Sveconorwegian magmatism. Deformation of this pluton is inferred to have occurred between  $1069 \pm 9$  and  $1047 \pm 1$ . Calc-alkaline gneiss/granite/gabbro units that comprise the variably deformed basement in the region are Telemarkian in age, ranging from  $1497 \pm 22$  to  $1520 \pm 14$  Ma; within this crystalline basement, the Nesflaten and Zinc Mine Banded Gneiss 'supracrustal' belts formed contemporaneously with orthogneisses of the Sauda Grey Gneiss Complex. The influence of later orogenic events on the U-Pb systematics of the Telemarkian rocks is minimal. Pre-Telemarkian inheritance in Telemarkian rocks is almost non-existent (only one grain >1600 Ma is recorded).

Chemical abrasion is successful in producing relatively tight single-age populations of zircon fragments. However, chemical abrasion can cause matrix-matching issues such as inter-element fractionation; the use of large rasters is suggested for analyses, and fractured/skeletal grains should be avoided. Both the accuracy and precision of final ages using LA-ICP-MS and chemical abrasion are less than 1%, the ages determined are within 1% of the TIMS ages also. Slight offsets between different sessions and untreated versus abraded grains versus TIMS ages, suggests this method is limited to 1% precision on material of this age.

								ľ				Ī		
Sample	Abraded?	Spot/Raster	Concordance	weighted mean 7/6 age	$2\sigma^1$	20 <sup>2</sup>	MSWD	u	SMIT		<b>MSWD</b>	u	% variation TIMS-vs. LA	% variation CA vs. non-CA
SA3-01	CA	Raster	-3 to +4.7	1039.2	5.6	15.0	0.26	18						
	CA	Raster	-4.4 to -1.2	1512.7	4.1	9.6	0.86	8						
C V 3-07	non-CA	Raster	-2.1 to 0	1521.1	5.3	12.3	1.30	٢						
70-040	Both	Raster		1516.3	3.4	13.7	1.03	15	1511.1 1.6		1.4	4	-0.66	0.55
									<sup>(7/6</sup> age) (95	% conf.)				
SA3-04	CA	Raster	-1.1 to +2.8	1508.6	5.8	14.0	0.54	11						
SA3-60	CA	Raster	-2.8 to +2.7	1518.0	6.0	12.9	0.47	10						
	CA	Raster	-3.3 to +0.7	1495.0	20.0		5.00	7	1497.0 22.0	401.00 140.0	8.8	5	0.27	
0 L V S	non-CA	Raster	+3.2 to +24.9	1434.0	57.0		5.70	ю	(upper int.)	(lower intercept)				
	non-CA	Raster	+27.2	1535.8	13.2	inhei	rited?							
	non-CA	Raster	+16.4	1619.9	14.4	inhe	rited?							
C A 7 50	non-CA	Raster	-3 to +6.9	1067.6	8.3	29.8	1.19	6	1046.7 1.1		0.1	4	1.96	
0C-1 HC									$^{(7/6} age)$ (2 $\sigma$ )					
	CA	Raster	+1.1 to +4.5	1507.6	3.6	9.7	0.43	21	1497.6 1.5		3.2	2	0.66	
38-7-26									(7/6 age) (2 $\sigma$ )					
no-/ 4/0									1500.4 1.7	inherited?				
									1507.2 1.8	inherited?				
C 4 7 01	CA	Raster	-0.7 to +2.9	1516.0	6.0	15.2	0.64	10	1503.0 1.0		1.2	4	0.86	
16-140									$^{(7/6} age)$ (2 $\sigma$ )					
SA7-130	CA	Raster	-1.3 to +1.2	1503.1	7.6	30.6	1.80	6	1511.0 2.6	806.00 34.0	2.1	8	0.52	
001-190				$(1502.0)^3$	(11.0				(upper int.)	(lower intercept)				
	CA	Spot	-37.1 to -3.9	1512.2	9.8		2.50	9						
	non-CA	Spot	-5.8 to +21.5	1520.0	19.0		7.70	9						0.51
	CA	Raster	-12 to -0.4	1517.9	4.3		0.46	10						
SA8-45	non-CA	Raster	-1 to +5	1541.0	170.		7.60	0						1.50
	CA	All	-37.1 to -0.4	1515.4	3.2		1.30	16						
	non-CA	All	-5.8 to +21.5	1525.0	16.0		8.80	~						0.63
	All	All	(6 rejected)	1520.0	7.0	14.0	1.06	18						
	CA	Raster	-7.9 to +2	1064.1	9.1		1.07	9						0.55
07.8 A.S	non-CA	Raster	-0.9 to +7.1	1070.0	14.0		3.00	٢						
0-000	All	Raster		1067.7	8.4		2.00	13						
				$(1069.3)^3$	(8.7)									

Table 3.1 Results of LA-ICP-MS and TIMS U-Pb study.  $^{1}$  = 2 standard errors,  $^{2}$  = 2 standard deviations,  $^{3}$  = determined using constant external error, CA = chemically abraded.

62

# The petrogenesis of 1.5 Ga magmatism in the Suldal Sector

Aim – In this chapter, whole-rock geochemical data from the ~1.5 Ga basement in the Suldal Sector are presented; the data are used to develop a model for the petrogenesis and tectonic setting of the main lithologies.

# 4.1 Introduction

The tectonic setting and petrogenesis of the crystalline basement rocks within the Telemarkia terrane is uncertain, primarily due to the scarcity in published geochemical data. Unpublished preliminary geochemical data on lithologies in the Suldal Sector suggest an active continental margin setting (Bingen et al. 2005b). Coeval volcanism in the Telemark Sector is bimodal with an A-type geochemical signature, and interpreted to have occurred in a continental 'within-plate' setting (Menuge & Brewer 1996), possibly in relation to extension in a 'behind-arc' convergent-margin setting (Slagstad et al. 2009). Abundant 1.52-1.48 Ga ages across the region suggest that the Telemarkia terrane was a location of substantial continental growth during this period (Bingen et al. 2005b; 2008a). The Gothian period (1.65-1.52 Ga) that occurred prior to the Telemarkian (1.52-1.48 Ga) period, built the Fennoscandian crust that is exposed to the east of Telemarkia, and is interpreted as an accretionary orogen with a single progressively maturing volcanic arc that is variably distal to Fennoscandia (Andersen et al. 2004a), or as several volcanic arcs accreted shortly after formation (Brewer et al. 1998; Åhäll & Connelly 2008). The Telemarkian crust may represent an extension of this accretionary orogen or may form an exotic microcontinent that was accreted during the Sveconorwegian orogeny (Åhäll & Connelly 2008; Bingen et al. 2005b).

# 4.2 Geological Framework

The Suldal Sector is an informal term for the central part of the west half of the Telemarkia terrane (Bingen et al. 2005b). It comprises a crystalline basement dominated by heterogeneous orthogneisses that are intruded by Sveconorwegian granitoids. Similar orthogneisses outcrop in the surrounding Hardangervidda, Rogaland and Telemark Sectors. The studied orthogneisses in the Suldal Sector have petrology, petrography and field-relations interpreted to represent mid- to supracrustal arc-related intrusions and volcanics (see Chapter 2). Gneisses sampled for geochemical analyses that are discussed in this chapter are taken from the region around the Sauda and Suldal communes (Figure 4.1). In the study area, the basement has been split up into the Sauda Grey Gneiss Complex, the Nesflaten Suite, the Zine Mine Banded Gneiss, Amphibolites and Granitoids (see Chapter 2), and are all 1.52-1.48 Ga in age (see Chapter 3).



Figure 4.1. Geological map of the study area showing the sample localities. Modified from Sigmond (1975).

# 4.3 Geochemistry

## 4.3.1 Analytical Techniques

Samples were analysed by XRF at the University of Leicester, UK, and by XRF and ICP-MS at the Geological Survey of Norway, Norway. The methods are outlined in the appendices. For XRF analyses at the University of Leicester, repeat analysis of certified reference materials gives a precision ( $2\sigma$ ) for major elements of <5% for SiO<sub>2</sub>, TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, and MgO, <10% for MnO, CaO and Na<sub>2</sub>O, and 11% for K<sub>2</sub>O; precision on the trace elements is <10 % at contents over 15ppm.

## 4.3.2 Element Mobility

The rocks studied are orthogneisses that have been metamorphosed under amphibolite-facies and variably retrogressed in the greenschist facies, thus, their geochemistry has been liable to variable element enrichment and depletion. In this chapter, element concentrations of the rocks are used to determine their petrogenesis, the mobility of these elements should therefore be acknowledged.

Large-ion-lithophile-elements (LILE; e.g. Rb, Ba, K and Sr) are generally considered to be mobile, whereas high-field-strength elements (HFSE; e.g. Th, Nb, P, Ti, Hf, Zr, Y), rare-earth–elements (REE) and transition metals (e.g. Ni, V, Cr and Co) are considered to be immobile (Rollinson

1993). Most major elements form definable trends in Harker diagrams, although  $K_2O$  and  $Na_2O$  are relatively scattered (Figure 4.3); this is expected given the abundant alteration of feldspar to sericite (see Chapter 2). Other LILE such as Rb and Sr also define very scattered trends. Transition metals such as Co and V form well-defined trends, whereas HFSE such as Nb and Zr display scattered trends. This scatter may be caused by the samples not representing a single co-magmatic suite, but arising from multiple magmatic suites all with slightly different 'liquid lines of descent'; given that the samples span a period of >15 million years, this is considered to be highly probable. In evolved samples, the varying fractionation and accumulation of accessory phases which have high partition coefficients for Zr and Nb (such as zircon, titanite and rutile) will also cause scatter.

The ability to distinguish a distinctive suite (the tholeiitic amphibolites; see following sections), suggests limited mobility of elements. In summary, the geochemistry allows for a rough approximation of original protolith compositions; with discrimination based on HFSE rather than LILE favoured for petrogenetic interpretations.

#### 4.3.3 Sauda Grey Gneiss Association

The grey gneiss a calcic to calc-alkaline differentiation trend, is magnesian, metaluminous to weakly peraluminous, and sub-alkaline (see Figure 4.2). The samples range from quartz gabbro and diorite, through tonalite, to granodiorite and granite (QAP), and are not adakitic but fall in the field of normal arc rocks (Sr/Y vs Y; Figure 4.2). In Harker diagrams (Figure 4.3) the major elements display defined trends but with variable scatter. Al<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub> are roughly constant up to approximately 60% SiO<sub>2</sub> then decrease. CaO, MgO, MnO and Fe<sub>2</sub>O<sub>3</sub> display negative trends, with a visible inflection in MgO at 55% SiO<sub>2</sub>. P<sub>2</sub>O<sub>5</sub> defines a negative trend above 65 % SiO<sub>2</sub>, and a scattered slightly positive trend at lower SiO<sub>2</sub> content. Na<sub>2</sub>O defines a poor trend, but seems to display an increase up to 60% SiO<sub>2</sub>, then a constant trend. K<sub>2</sub>O defines a positive trend with significant scatter; an inflection at 69% marks an increase in K<sub>2</sub>O%.

The grey gneiss exhibits a variety of trends in trace elements relative to  $SiO_2$  (Figures 4.4 & 4.5). Rb and Ba both increase but exhibit considerable scatter, especially in Rb in evolved samples. Sr shows a negative correlation after ~65 % SiO<sub>2</sub>, but is widely scattered at lower SiO<sub>2</sub>. Ni, Cr, Co and V all show negative trends with silica enrichment (Cr and Ni not shown), but with some variation between them. V displays a rather consistent and well-defined trend from ~200ppm to 0ppm with a possible inflection to a shallower trend at 63% SiO<sub>2</sub>. Co displays a similar trend to that of V, decreasing from ~50ppm to 3ppm, again with an inflection at 63%. Both Nb and Zr show slightly increasing trends with SiO<sub>2</sub>, but there is considerable scatter. LREEs exhibit scattered trends especially in evolved samples, but show a general increase with silica enrichment. MREEs also show scattered positive trends. HREEs show scattered trends, but are fairly constant up to ~69% SiO<sub>2</sub>, then display a sudden increase in most of the evolved samples.



Figure 4.2. Geochemical classification of magmatic suites in the Suldal Sector. QAP = Quartz, Alkali-Feldspar, Plagioclase - IUGS classification, based on normative calculations; Y versus Sr/Y after Defant & Drummond (1990); FeO<sup>t</sup>/FeO<sup>t</sup>+MgO (Fe\*), Na<sub>2</sub>O+K<sub>2</sub>O-CaO (Modified Alkali Lime Index), ASI (Aluminium Saturation Index - molar Al<sub>2</sub>O<sub>3</sub>/CaO+Na<sub>2</sub>O+K<sub>2</sub>O) after Frost et al. (2001). Sub-alkaline/ alkaline field (Na<sub>2</sub>O+K<sub>2</sub>O) after Irvine & Baragar (1971).

In Primitive Mantle normalised spider diagrams (Figure 4.6) all lithologies show enrichment in all elements relative to Primitive Mantle. The greatest enrichment is that of the LILE, with Rb contents 30 to 300 times greater than Primitive Mantle. Strong depletion relative to other elements is seen in Nb, Ta, Sr, P and Ti. The depletion in Nb and Ta is recorded in basaltic compositions, and is



relatively constant with increasing silica enrichment. Sr, P and Ti are only slightly depleted in the basaltic samples, but exhibit a much greater degree of depletion with increasing silica enrichment.

Figure 4.3. Major element oxides versus  $SiO_2$  for magmatic suites in the Suldal Sector. Symbols as in figure 4.2.

In chondrite normalised REE spider diagrams (Figure 4.7), all lithologies show LREE enrichment relative to MREE, LREE enrichment relative to HREE, and only slight MREE enrichment relative to HREE. The amount of LREE to MREE enrichment is relative constant up to 60% SiO<sub>2</sub>, then



Figure 4.4. Selected trace elements versus SiO<sub>2</sub> for magmatic suites in the Suldal Sector. Symbols as in figure 4.2.

increases in more evolved samples. LREE to HREE enrichment is fairly constant throughout the suite, but exhibits large scatter in samples between >68% SiO<sub>2</sub>. MREE to HREE enrichment slightly decreases with silica enrichment. Total REE contents show a positive but scattered trend. In basaltic samples both small negative and positive Eu anomalies are exhibited, with increasing silica



Figure 4.5. Selected trace and REE elements versus SiO<sub>2</sub> for magmatic suites in the Suldal Sector. Eu\* = Eu/( $\sqrt{\text{Sm}^*}\sqrt{\text{Gd}}$ ). Symbols as in figure 4.2.





Figure 4.6. Primitive mantle normalised (Sun & McDonough 1989) spider-diagrams.



Figure 4.7. Chondrite normalised (Sun & McDonough 1989) spider-diagrams.

samples display less enriched profiles, two of which have positive Eu anomalies; these samples likely represent residual melts or cumulates with cumulative feldspar.

## 4.3.4 Zinc Mine Banded Gneiss

The Zinc Mine Banded Gneiss is a succession of calc-alkaline, metaluminous to weakly peraluminous and magnesian orthogneisses. The sample selection is bimodal in terms of silica content although intermediate compositions were observed in the field; differentiation trends are therefore not well-defined. Both the mafic and felsic populations show considerable scatter, but broadly correlate with trends shown by the Grey Gneiss. The REE were not measured on the ZMBG, but La and Y contents are similar to that of the Grey Gneiss, suggesting similar LREE to HREE fractionation and enrichment levels.

#### 4.3.5 Amphibolites

As discussed in Chapter 2, the amphibolites are not amphibolites *senso stricto*, but are a suite largely comprising amphbolites *senso stricto*, but also comprising amphibole-rich intermediate to felsic lithologies which are spatially related to amphibolite units. The amphibolites are calc-alkaline to alkali-calcic, ferroan, metaluminous and sub-alkaline (Figure 4.2). The suite displays a differentiation trend on the Harker diagrams that is well-defined above ~53% SiO<sub>2</sub>; at lower SiO<sub>2</sub> the trend is near vertical such that the samples appear to be scattered in some elements. In MgO, Co and V, the amphibolites have a well-defined negative trend throughout, in other elements (P<sub>2</sub>O<sub>5</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, Sr) the amphibolites increase steeply to ~53% SiO<sub>2</sub> then have a shallow negative trend, and in some elements (REE, Nb, Zr) the amphibolites increase steeply at first then increase more gradually after ~53% SiO<sub>2</sub>. Some of the most primitive samples of the amphibolites suite (high MgO, and low SiO2), exhibit positive Eu anomalies and are less-enriched in REE (see Figure 4.7); these samples likely represent magmas that are cumulative in feldspar.

Above ~53% SiO<sub>2</sub> the trends displayed by the amphibolites are generally sub-parallel to the Sauda Grey Gneiss trends, except that depletion or enrichment relative to the Grey Gneiss is evident in most major and trace elements. In the major elements the amphibolites have higher TiO<sub>2</sub>, Na<sub>2</sub>O,  $P_2O_5$  and Fe<sub>2</sub>O<sub>3</sub>, lower Al<sub>2</sub>O<sub>3</sub> and CaO, and similar K<sub>2</sub>O contents. In the trace elements the amphibolites have higher Nb, Y, Zr, and V, and similar Rb and Ba; Co is higher in the most mafic amphibolites, but then drops off to a lower trend than that of the Grey Gneiss; Sr displays similar behavior to Al<sub>2</sub>O<sub>3</sub> and is low at the mafic end-member, but then has similar contents to that of the Grey Gneiss; and Al/Ga, which can be used to indicate feldspar fractionation is lower in the amphibolites. At similar SiO<sub>2</sub>, the REE display greater enrichment in the amphibolites relative to the Grey Gneiss (see Figure 4.5), although the LREE/MREE, LREE/HREE and MREE/HREE are similar between the two suites. In the Primitive Mantle normalized plot (Figure 4.7) the amphibolites exhibit similar depletions to those displayed by the Grey Gneiss. In summary, the
amphibolites have similar LILE (except for Sr), greater contents of incompatible elements, and higher Fe/Mg than the Grey Gneiss.

#### 4.3.6 Granitoids

The granitoids are porphyritic, granodioritic to granitic, calc-alkaline, metaluminous to weakly peraluminous and sub-alkaline (Figure 4.2). The majority of the samples plot in the ferroan field (Fe\*), however, this does not mean they have evolved from less-differentiated ferroan magmas, since at high silica content most magmas become enriched in Fe\* (Frost et al. 2001). The granitoids have similar major and trace element contents to those in the Sauda Grey Gneiss (Figures 4.3 to 4.6). In Primitive Mantle normalized diagram (Figure 4.7) the granitoids display similar enrichment and depletions to those of the most evolved members of the Grey Gneiss Suite.

## 4.4 Petrogenesis

The Zinc Mine Banded Gneiss and granitoids were only studied at a reconnaissance level, thus their petrogeneses is not discussed separately. These suites have petrographic and petrologic similarities to the Sauda Grey Gneiss and are of the same age; therefore they are assumed to have a similar petrogenetic origin.

#### 4.4.1 Grey Gneiss

The LILE enrichment and depletion in Nb, Ta, P and Ti are all characteristic of magmas produced in a supra-subduction zone setting. LILE enrichment (Rb, Ba, K) is generally attributed to addition of these elements from subduction zone fluids (e.g. Saunders et al. 1991). Depletion in Nb and Ta has been related to both retention of phases that accommodate these elements in the downgoing slab and to the immobility of these elements relative to LILE (e.g. Saunders et al. 1980; Green et al. 1981; McCulloch & Gamble 1991; Kelemen et al. 1993; Brenan et al. 1994). The fact that the basaltic compositions exhibit Nb and Ta depletion is compatible with a pre- crustal-differentiation origin for this depletion. Ti and P exhibit greater depletion with increasing SiO<sub>2</sub>, therefore they are related to processes occurring during differentiation. Ti is likely depleted by fractionation of Fe-Ti oxides and titanite, and P is depleted by fractionation of apatite. The HFSE enrichment in the Grey Gneiss is typical of continental arc magmas. This enrichment, which is not typically observed in intra-oceanic arcs, is often related to an enriched source, e.g. asthenospheric mantle as opposed to depleted mantle, and/or to crustal contamination (i.e. the 'within-plate' component; Pearce 1983).

Evolved compositions have various origins in arc magmatic suites. Simplistically these involve fractional crystallisation with or without assimilation (e.g. Bowen 1928; Reagan et al. 2003; Kuritani et al. 2005; Greene et al. 2006), or partial melting of already crystallised crust (e.g. Tamura & Tatsumi 2002; Smith et al., 2003; Vogel et al. 2006). In reality both of these mechanisms likely occur together; in oceanic arcs where older silicic crust may not exist, the emplacement of mafic

sills, remelting of previous sills, fractionation of both mafic sills and partial melts, and mixing between different compositions, can lead to a crustal section with a range of compositions typical of volcanic arcs (i.e. a deep hot crustal zone; Annen et al. 2006).

Straight-lines on differentiation trends are indicative of magma mixing. Within the Grey Gneiss, straight-lines in Harker diagrams are exhibited in some elements, but the existence of inflections in many elements suggests fractional crystallisation played a significant role in differentiation. The sudden increase in REE, Zr, Y and K at ~69% SiO<sub>2</sub> means that intermediate compositions do not fall on a mixing array between felsic and mafic end-members, excluding a mixing-hypothesis for intermediate compositions. Inflections occur at lower SiO<sub>2</sub> also, for example MgO at ~55-60% SiO<sub>2</sub> and Na<sub>2</sub>O and Al<sub>2</sub>O<sub>3</sub> at ~60-65% SiO<sub>2</sub> and in trace elements at ~63% SiO<sub>2</sub> (Ga) and ~60-65% (Sr, Co). Thus, basaltic andesite compositions do not correspond to mixtures between basaltic and andesitic members, excluding a mixing-process at low silica enrichment. At 50 % SiO<sub>2</sub>, Ni does not fall on a trend but is widely scattered, suggesting variable olivine content in the basaltic endmembers. The evidence noted above points towards fractional crystallisation from mafic endmembers, as opposed to mixing between mafic and silicic end-members, for the main process of differentiation within the suite. However, this does not exclude a partial melting process for differentiation. The discrimination between partial melting and fractional crystallisation can be achieved using the changes in REE abundance with magma differentiation (Brophy 2008). In the Grey Gneiss, the slightly increasing LREE, and constant HREE at intermediate compositions are most compatible with fractionation of basalt in the lower crust with amphibole present, and the enrichment in all REE at high silica content is compatible with mid-to upper-crustal fractionation of basalt where amphibole is not present (Brophy 2008).

High-silica melts generally contain crystallising phases that have high partition coefficients for LREE, MREE, and HREE (e.g. zircon, allanite, apatite, monazite). Within the Grey Gneiss suite, a sudden increase is seen in MREE and HREE at ~69% SiO<sub>2</sub>. If this point marks the onset of crystallisation of certain accessory phases, then the sampled orthogneisses must contain accumulations of these phases, as opposed to originating as residual liquids. Apatite is found in most samples with SiO<sub>2</sub> greater than 60%, thus, it is not expected to cause the change at ~69%. Monazite is not recorded in any of the samples and is thus assumed not to be a fractionating phase. Zircon has  $D_{LREE} < D_{MREE} < D_{HREE}$  and allanite has  $D_{LREE} > D_{MREE} > D_{HREE}$ , thus, zircon is the most likely candidate for controlling the observed REE changes. An increase in Zr at ~69 % corresponds to the MREE and HREE increase, supporting the hypothesis that this phase is responsible for the change in REE concentrations. However, samples with low HREE samples do not have corresponding low Zr values, invalidating this hypothesis. Another phase that accommodates both Zr and REE is amphibole. The termination of amphibole as a fractionating phase would produce an increase in

REE and Zr, as these would no longer be removed from the melt. As  $D_Y$  in amphibole is greater than 1, the constant Y abundances and then sudden increase at ~69% support this notion. Thus, in agreement with the trends modelled by Brophy (2008), it is suggested that the change in REE concentrations in the Grey Gneiss suite is strongly controlled by amphibole fractionation.

Along with amphibole, the role of other fractionating minerals can be assessed using major and trace element changes with differentiation. The increase in the size of the negative Eu anomaly with differentiation indicates plagioclase was fractionating throughout the entire differentiation process. The inflection in the  $Al_2O_3$  and Sr trends indicate that plagioclase had a greater control on differentiation after ~60 % SiO<sub>2</sub>. Decreases in CaO, MgO, and Fe<sub>2</sub>O<sub>3</sub>, and increases in Na<sub>2</sub>O and K<sub>2</sub>O with differentiation, are compatible with fractionation of clinopyroxene. Decreases in transition metals (Ni, Co, V), MgO and Fe<sub>2</sub>O<sub>3</sub> are compatible with fractionation of Fe-Ti oxides. In summary, the trends displayed are typical of POAM - Plagioclase, olivine (and/or orthopyroxene), clinopyroxene (and/or amphibole) and magnetite fractionation; such fractionation is typical in arc suites for the formation of andesitic compositions from mafic parent melts (Gill 1981).

To assess whether the crystallizing phases determined above are compatible with the REE trends, a simple fractional crystallisation model was tested (Figure 4.8; Table 4.1). There are inherent problems with modelling of trace elements (see Rollinson 1993); particularly of concern are the partition coefficients used, as these are dependent on factors which are often not controlled in the modelling, i.e. temperature, oxygen fugacity, pressure, and  $H_2O$  activity. Partition coefficients also vary as the melt evolves. However, modelling can still provide a useful indication of what assemblages are compatible with the observed trends. REE concentrations were modelled in two stages using Rayleigh fractional crystallisation; these stages comprise the fractionation of an average mafic Grey Gneiss composition to produce an andesitic composition, and the fractionation of an average andesitic composition to produce a dacitic composition. At higher silica contents trace elements become highly dependent on accessory phases such as zircon, thus, rhyolitic compositions were not modelled. In the first stage, a best fit is achieved with 30-40% fractionation of an assemblage comprising plagioclase, clinopyroxene, hornblende and magnetite. In the second stage, a best fit is achieved by 30-40% fractionation of an assemblage similar to that in stage 1, but with greater plagioclase content and the addition of minor apatite content. These assemblages are similar to those modelled in other Precambrian continental arcs (Slagstad et al. 2004).

In summary the major, trace and REE trends within the Grey Gneiss suite suggest that it formed by fractional crystallisation of a basaltic parent melt, with multiple stages of fractionation probably occurring at different levels in the crust. This scenario is compatible with a deep hot crustal zone setting (Annen et al. 2006). The geochemistry of the studied suites suggests formation in a volcanic

arc setting. The range and abundance of evolved compositions is suggestive of a mature island arc or continental arc; this inferred tectonic setting for the Grey Gneiss suite is here named the Suldal arc.



Figure 4.8. Rayleigh fractional crystallisation modelling of REE contents in the Sauda Grey Gneiss. Basalt, Andesite and Dacite are average REE contents of the Grey Gneiss from 45-55%, 55-63% and 63-67% SiO<sub>2</sub> respectively. Modelled melts are shown at 20% increments. Results and partition coefficients are shown in table 4.1.

#### 4.4.2 Amphibolites

The amphibolites, although displaying similar trends to the Grey Gneiss Suite, exhibit features that are typical of 'A-type' rocks, i.e. low CaO, high Fe/Mg and Ga/Al, and enrichment in incompatible elements (Whalen et al. 1987; Collins 1982). A-type magmas are typical of post-collisional and extensional tectonic settings, but are not typical of the main arc-forming stage in subduction-zone settings (Bonin 2007). In the Suldal Sector, at least some of the amphibolites crystallised during the ~1500 Ma event (see Chapter 3). Thus, formation of the amphibolites for at least some of the samples must have occurred contemporaneously with formation of the Grey Gneiss suite. Different mafic bodies within the study area have different structural fabrics recorded in them, with some being undeformed dyke-like intrusions; this suggests that emplacement of these magmas may have occurred on multiple occasions since the ~1500 Ma event. The gabbro bodies that are inferred to be ~1500 Ma are typically less deformed than the Grey Gneiss they intrude, suggesting the amphibolites may have intruded in a later stage of arc development than the bulk of the Grey Gneiss, however, one sample of amphibolite is an enclave from within highly deformed Grey

Gneiss, suggesting earlier or concomitant formation. Also, two samples from a zone of magma mingling ('hybrid' in figures 4.2 to 4.5), have major and trace element contents that straddle the magnesian Grey Gneiss and ferroan amphibolite trends, suggesting some mingling has occurred between these magma series upon intrusion. The A-type amphibolite suite is interpreted to have evolved contemporaneously with the Grey Gneiss suite, thus, the cause of the compositional difference between the two suites is likely related to changes during magma differentiation, changes in source conditions, and/or changes in the source material.

As previously discussed, fractionating phases in the Grey Gneiss suite likely included plagioclase, olivine, pyroxene, amphibole, olivine and Fe-Ti oxides. The amphibolites have higher Ga and lower CaO and  $Al_2O_3$ , this can be explained by leaving a plagioclase residue in the parent melt. The lower MgO in the amphibolites, suggests a greater olivine residue. V is higher in the more mafic end of the amphibolite suite, but has a sharp decrease so that intermediate compositions have lower V than the Grey Gneiss. TiO<sub>2</sub> is also initially much higher in the amphibolites. The trends in Ti and V suggest that residual Fe-Ti oxides were less important in the parent melt of the amphibolites, but probably formed part of the fractionating assemblage later on in the differentiation. The compositional differences discussed so far can be related to an increase in residual plagioclase and olivine in the amphibolites, and an increase in residual Fe-Ti oxides in the Grey Gneiss suite.

The amphibolites also show an increase in the HFSE, MREE and HREE (i.e. the incompatible elements), whereas the LILE are similar between the two suites. Increases in incompatible elements can be related to either smaller degrees of partial melting, or partial melting of a mantle source that is less depleted by previous melt extraction (enriched mantle). Isotope data can often aid the discrimination between these processes. Hafnium in zircon data on two amphibolite samples (SA7-86, ROG525; chapter 5) suggest that the source was similar in terms of crustal versus mantle contribution. 'Enriched mantle' sources, which in arc/back-arc settings are generally related to asthenospheric mantle input, typically lack a negative Nb anomaly. The amphibolites have a negative Nb anomaly similar to that of the Grey Gneiss, suggesting a similar mantle source, or at least that the mantle sources underwent the same modification by subduction-zone fluids. The geochemical data thus suggest that two processes are responsible for the development of the two suites, the fractionating assemblage, and the degrees of partial melting.

The amphibolite suite is likely produced by fractionation of a parent magma with residual plagioclase and olivine ( $\pm$  clinopyroxene/hornblende), whereas the Grey Gneiss includes Fe-Ti oxide as a residual phase. Differences in the stability of crystallizing phases during magma differentiation depend on a number of intensive parameters, namely temperature, pressure, oxygen fugacity and water activity. Experimental studies have demonstrated the significance of water

content in primary basaltic magmas, in particular an increase in the water content leads to the early appearance of Fe-Ti oxides and the suppression of plagioclase crystallization (Gaetani et al. 1993; Sisson & Grove 1993; Kawamoto 1996). An increase in pressure leads to the reversal of this, with earlier plagioclase crystallisation and a greater proportion of plagioclase relative to Fe-Mg silicates (Grove et al. 2003). Oxygen fugacity generally correlates with water activity, with reducing conditions normally being relatively anhydrous and oxidizing conditions being hydrous. The effect of oxygen fugacity has similar effects to that of water, although water has a much greater effect than oxygen fugacity or pressure (Hamada & Fuji 2008). Oxygen fugacity controls the stability of Fe-Ti oxides (Feig et al. 2006; Botcharnikov et al. 2008), with magnetite crystallizing first in conditions above fayalite-magnetite-quartz (FMQ), and ilmenite appearing first in conditions below FMQ (Toplis & Carroll 1995).

The relative amount of Fe-Ti oxide to plagioclase crystallisation has a strong control on magma differentiation. If Fe-Ti oxides crystallize early, then the magma will become increasingly enriched in silica, and enrichment in iron will be suppressed; thus, the melts will follow a calc-alkaline trend. If Fe-Ti oxides do not crystallize early on, then the melt will become progressively enriched in iron, and form a tholeiitic trend. This leads to the general inference that calc-alkaline magma suites are relatively hydrous and oxidizing, and tholeiitic magma suites are anhydrous and reducing (Sisson & Grove 1993; Baker et al. 1994).

Tholeiitic (ferroan) magmas are typical of oceanic island arcs, where the crust is relatively thin, however, there are examples where they occur in the same volcanic arc as calc-alkaline (magnesian) magmas, for example in the Cascades (Baker et al. 1994), the Aleutians (Kay et al. 1982) and in Japan (Hunter 1988; Sakuyama 1981). The formation of tholeiitic and calc-alkaline trends in the same volcanic system has been explained by the difference in intensive parameters, for example Baker et al. (1984) advocate a deep source control on magma trends whereby the water content in the mantle varies, causing differences in fractionating assemblages in the parent magmas. At Aso volcano, SW Japan, a shallow level control is advocated for differentiation of tholeiitic and calcalkaline trends (Hunter 1998); whereby predominantly tholeiitic magmas evolve to calc-alkaline magmas with a change in the fractionating assemblage, but also with a decrease in crustal contamination. This is contrary to the general belief that calc-alkaline magmas involve greater amounts of crustal contamination (e.g. Grove & Baker 1984; Myers et al. 1984; Fujinawa 1988; Hora et al. 2009). Hora et al. (2009) advocate a shallow-level control on differentiation of tholeiitic to calc-alkaline suites, but where tholeiitic magmas evolve to calc-alkaline magmas via assimilation of crust/melts. In this model, tholeiitic series are 'clean' and characterized by rapid magma throughput and minimal crustal contamination, whereas calc-alkaline magmas are 'dirty', involving compartmentalized, stagnant assimilation-prone magma differentiation (Hora et al. 2009).

From the examples listed above, it would seem that the petrogenesis of the amphibolites evolving contemporaneously with the Grey Gneiss, could be explained by either a shallow- or deep-level control on the intensive parameters, which in turn affected the fractionation assemblage. However, on closer examination of the amphibolite suite, it appears such iron-enrichment is not comparable with examples such as those listed above, and requires further explanation.



Figure 4.9. SiO<sub>2</sub> versus FeO<sup>t</sup>/MgO for selected continental arc and continental rift data (grey circles) compared with the Sauda Grey Gneiss (black diamonds) and amphibolite (white circles) suites. Data from the Georoc database (http://georoc.mpch-mainz.gwdg.de)

Figure 4.9 shows data from the Grey Gneiss and amphibolite suites compared to published data from a variety of continental arc and continental rift settings. Such extreme iron enrichment in basaltic lithologies is rare to non-existent in arc settings, but is more common in continental rift settings, particularly in the Columbia River Flood Basalts (CFB). Such iron-rich mafic rocks are commonly referred to as ferrobasalts, notable examples include oceanic islands (Galapagos, Baitis & Lindstrom 1980; Thingmuli, Carmichael 1964), continental rifts (Snake River Plain, Leeman et al. 1976), layered intrusions (Skaergaard; Wager 1960) and residual magmas associated with

anorthosite massifs (Laramie Anorthosite Complex; Scoates et al. 1996). These examples exhibit lithologies with similar iron contents to that recorded in the amphibolites suite (Figure 4.10a).

Extreme iron enrichment can be achieved by differentiation of parent magmas involving no Fe-Ti crystallization but dominant plagioclase crystallisation in the early stages of differentiation, such that iron is enriched, and silica is not enriched and possibly even depleted. This differentiation has been reproduced experimentally at low pressure to explain the origin of oceanic tholeiites and the Skaergaard trend (e.g. Spulber & Rutherford 1983; Toplis & Carrol 1985; Snyder et al. 1993; Thy et al. 2006), but does not explain formation in settings with thick continental crust such as the Snake River Plain. Recent studies however have focused on this latter setting; experiments with low water contents at a variety of pressures have been conducted to try and reproduce the compositions seen in the Snake River Plain and in other iron-enriched magma series (Villiger et al. 2004; Nekvasil et al. 2001; 2004; Whitaker et al. 2007; 2008). The results from Whitaker et al. (2007) are displayed in figure 4.10b; the experiments were conducted on an olivine tholeiite with reducing conditions ( $\Delta$ FMQ ~ -2), low water activity (0.05 wt% H<sub>2</sub>O), and pressures from 0 to 9.3 Kbar. At all pressures, magma differentiation involved significant iron enrichment and a lack of silica enrichment. Also shown on figure 4.10b are experimental data from Sisson et al. (2005), which are similar to the original calc-alkaline experiments of Sisson & Grove (1993); iron enrichment during magma differentiation varies according to a change in oxygen fugacity, but silica is highly enriched leading to calc-alkaline differentiation trends. In summary, experimental data show that water content has a critical control on fractionating assemblage, and thus, whether tholeiitic or calcalkaline trends are followed. The amphibolite suite must have formed in conditions with very low water activity similar to that advocated for continental rift ferrobasalts, and the Grey Gneiss suite likely formed in hydrous conditions similar to those recorded in modern arcs.

The threshold water content at which iron-enriched tholeiitic trends will form instead of more typical silica-enriched calc-alkaline trends, is not well constrained, but is inferred to be between 0.5 and 0.8 wt% H<sub>2</sub>O at 9.3 Kbar using continental rift starting materials (Nekvasil et al. 2001). The scarcity of iron-enriched magma series occurring in volcanic arcs suggests that the crust in this setting typically has a higher water content than this threshold. Where iron-enriched compositions are more common, e.g. oceanic islands and continental rifts, there is typically a plume-related source advocated for formation of the magma series; this mantle source is inferred to be drier and more reducing than in arc settings (e.g. Christiansen & McCurry 2009), and in some examples, such as the Etendeka-Parana flood basalts province, the iron-enrichment may even be enhanced by further processes such as iron-rich streaks in the mantle plume (Gibson et al. 2000; Ewart et al. 2004).



Figure 4.10. A) SiO2 versus Fe\* (Frost et al. 2001) for the Sauda Grey Gneiss and amphibolite suites compared with data from Thingmuli (Iceland; Carmichael 1964), the Craters of the Moon suite in the Snake River Plain (Stout et al. 1994; Hooper 2000; McCurry et al. 2008; Putirka et al. 2009), the Sherman Batholith (Proterozoic tholeiitic A-type pluton in Wyoming; Frost et al. 1999), and the Sybille intrusion (residual tholeiitic rocks associated with the Proterozoic Laramie Anorthosite Complex, Mitchell et al. 1996; Scoates et al. 1996).

B) The Sauda Grey Gneiss and amphibolite suite compared with experimental data using anhydrous olivine tholeiite (Whitaker et al. 2007), hydrous medium-K high-Al basalt (Sisson et al. 2005) and hydrous peridotite (Gaetani & Grove 1998). Grey lines show the approximate differentiation trends for experimental data; black dotted line shows the evolution of the amphibolite suite.

The contemporaneous formation of continental rift-like tholeiitic (ferroan) amphibolites (at least on this coarse Precambrian timescale), with the subduction-related calc-alkaline (magnesian) Grey Gneiss suite, is rather anomalous within the global rock record. As stated previously, the

compositional difference between the two suites is likely related to changes during magma differentiation, changes in source conditions, or changes in the source material. The previous sections have discussed changes in sources conditions that form tholeiitic versus calc-alkaline magma series. To further assess whether different sources were involved, the trace element content of the two suites can be examined; this is shown in figure 4.11 using primitive mantle normalized plots and trace element ratio binary plots. The amphibolites feature similar LILE and HFSE enrichment to the Grey Gneiss suite, similar LILE/HFSE ratios, and a similar to slightly lessnegative Nb anomaly. In the Th/Yb versus Ta/Yb and the Nb/Y versus Zr/Y plots, the amphibolites overlap the Grey Gneiss, and exhibit similar degrees of subduction-zone related enrichment. The data indicate a similar subduction-zone related source for the amphibolites as for the Grey Gneiss; if the source for the amphibolites was related to a mantle plume or asthenospheric mantle, then the data should fall within the tramlines on the Ta/Yb versus Th/Yb and Zr/Y versus Nb/Y diagrams, and should lack a Nb anomaly.

On the basis of comparison with experimental data and geochemical data, the petrogenesis of the amphibolites suite is inferred to have involved a source similar to that of the Grey Gneiss, but with crystallisation under different intensive parameters, namely very low water content (<0.5% H<sub>2</sub>O) and reducing conditions ( $\Delta FMQ \sim -1$  to -2). How such conditions prevailed in an arc setting remains speculative, and due to the lack of other comparable suites in the rock record, may be a rare sequence of events. One similar example but with less extreme end-member compositions, may provide a more recent analogue however for the setting of this Telemarkian magmatism. Shuto et al. (2006) describe a model for the petrogeneses of magmatic suites that developed during the opening of the Japan sea; in their model, the early stages of the Japan sea opening (Early Miocene) involved asthenospheric mantle upwelling with partial melting of the overlying lithosphere and continental rifting; partial melting of the lower crust forming continental-rift silicic magmas. This process of continental rift magmatism is similar to that advocated for the Rjukan rift in central Telemarkia (Menuge & Brewer 1996; Sigmond et al. 1997; Slagstad et al. 2009), in which partial melting of crust formed the Rjukan rhyolites at ~1500 Ma (Dahlgren et al. 1990). The geochemistry of basaltic magmatism that occurred in the Rjukan Rift (Vemork formation) is shown in figure 4.11 for comparison; compared to the Grey Gneiss and amphibolites, the Vemork basalts are much less LILE-enriched, lack a Nb anomaly, and fall within the tramlines in the Zr/Y versus Nb/Y plot, therefore they are compatible with an origin in the asthenospheric mantle.

The opening of the Rjukan rift in the Telemark Sector (and the related asthenospheric mantle upwelling), occurred contemporaneously with the amphibolite and Grey Gneiss magmatic suites in the neighbouring Suldal Sector. A tectonic model for the evolution of these magmatic suites is shown in figure 4.11. It is inferred that extension of the overriding plate (Telemarkia) that was

likely related to slab-rollback, caused localized extension of the crust forming the Rjukan rift (Slagstad et al. 2009). Extension of the lithosphere allowed uprise of asthenospheric mantle, this uprising mantle produced the Rjukan rhyolites via crustal anatexis, and later produced basaltic magmatism after further crustal extension. At the same time, dehydration melting in the mantle wedge above the subducting slab was producing typical arc magmatism (Sauda Grey Gneiss). At certain points in time, dry and reducing conditions existed in the zone of melt generation, such that the tholeiitic amphibolite suite was produced. Differentiation of the tholeiitic magma series may have been aided by crustal extension, allowing rapid magma uprise without crustal contamination (e.g. Hora et al. 2009). The prevalence of reducing and dry conditions may have been aided by the uprise of asthenospheric mantle; this mantle uprise is interpreted to be a source of heat but not a source of material for the generation of the amphibolites.

As stated above, the existence of dry and reducing conditions in a supra-subduction setting is rare. Known water contents of arc magmas are up to 6 wt% (Sisson & Layne 1993). The average oxygen fugacity of arc magmas is estimated to be  $\Delta$ FMQ -1 to +2 whereas the upper mantle has a range from  $\Delta$ FMQ -4 to +2, and the lower mantle is much more reducing at  $\Delta$ FMQ <-5 (Carmichael & Ghiorso 1990; Parkinson & Arculus 1999; McCammon 2005; Rowe et al. 2009). The oxygen fugacity of lower arc crust has been estimated for the Talkeetna arc to be  $\Delta FMQ + 1 \pm 1$  (Behn & Kelemen 2006). The increased oxygen fugacity in arc magmas relative to the mantle has been attributed to the addition of volatiles derived from dehydration of the subducting slab; in a study of volcanic arc magmas from the Cascades arc, oxygen fugacity was correlated with fluid-mobile trace element and LREE contents (Rowe et al. 2009). In the Taupo volcanic zone of New Zealand, oxygen fucacity is correlated with slab-derived fluids such as Ba and Cl (Deering et al. 2010). In the latter study a temporal change is observed from wet-oxidising magmas to dry-reducing magmas, and is thus related to a decrease in the flux of subduction-related volatiles. Average oxygen fugacity in the Taupo magmas ranges from  $\Delta FMQ + 0.5$  to +1.5, and the change occurs over ~100,000 years. A temporal change like this may have existed in the Suldal arc, but would be difficult to distinguish on a Precambrian timescale. The range in oxygen fugacity in this example is much less extreme than that required to produce the variation between the iron-enriched tholeiitic amphibolite suite and the calc-alkaline Grey Gneiss suite.

The cause of dry and reducing conditions during early differentiation of the amphibolite suite remains speculative, since its geochemistry is indicative of subduction-zone enrichment in



Comparison between basaltic compositions



Figure 4.11. Schematic model for the tectonic setting of ~1500 Ma magmatism in Telemarkia. The magnesian Sauda Grey Gneiss suite is formed by melting in the mantle wedge with a subduction-zone fluid and sediment flux typical of continental arcs; the ferroan amphibolite suite had a similar parent magma but formed in anhydrous and reducing conditions. The magnesian rhyolites (Tuddall Fm) of the Rjukan Rift in the Telemark Sector formed by crustal anatexis fluxed by asthenospheric mantle, and the basalts (Vemork Fm) formed after underplating by asthenospheric mantle. Plots of mafic end-members of the three suites are shown to compare geochemistry; the Grey Gneiss and amphibolite suites have similar signatures (subduction-related), and the Vemork Fm has a significantly diferent signature (asthenospheric mantle input). Subduction zone model modified from Shuto et al. (2006); FeOt/FeOt+MgO versus SiO2 after Frost et al. (2001); Th/Yb versus Ta/Yb after Pearce (1982); Nb/Y versus Zr/Y after Fitton et al. (1997).

fluids/volatiles. A possible explanation is that at certain points in time during the evolution of the Suldal Arc, basaltic parent magmas forming in a hot deep crustal zone were dehydrated; this

occurred through a decrease in subduction-zone fluid flux, and to successive melt production and heating from magmatic underplating; this would have left the magma dehydrated but not refractory (Landenberger & Collins 1996), and would also have a higher solidus than normal hydrous arc magma. The extra heat required for melting of dehydrated mafic crust was likely provided by asthenospheric mantle upwelling; also, an extensional setting meant that melts could intrude along weaknesses into the upper crust, and thus avoid assimilation of surrounding wet and oxidizing crust.

### 4.5 Discussion

#### 4.5.1 Origin of A-type granites.

If the tholeiitic (ferroan) amphibolites differentiated into granitic compositions, then based on their geochemistry these would fall into the category of A-type granites (low CaO, high Fe/Mg and Ga/Al, and enriched incompatible elements); they would thus provide a genetic link between tholeiitic mafic magmas and A-type felsic magmas. The amphibolite suite has differentiated into granodioritic compositions that are coarse-grained porphryritic amphibolites bodies. At high silica contents calc-alkaline (magnesian) trends converge with ferroan trends, hindering the distinction between different granite suites (Frost et al. 2001). On the Fe\* versus SiO<sub>2</sub> plot (Figure 4.2) a couple of the granitoids fall on the ferroan trend; these coarse-grained porphyritic granitoids are similar to other granites in the region, including those that are Sveconorwegian in age. Thus, it cannot be determined without further dating, whether the amphibolite suite has fully differentiated into A-type granites, or whether such lithologies in the region are only related to Sveconorwegian magmatism.

The connection between tholeiitic (i.e. ferroan and anhydrous source) magmas, and A-type granites, is known as the tholeiite connection (Frost & Frost 1997). This model is postulated for the petrogenesis of Proterozoic Rapakivi-type granites (e.g. Sherman Batholith, US), and involves the intrusion of tholeiitic basalts into the lower crust, remelting of these basalts, and the intrusion of subsequent melts into the middle crust to form A-type plutons. This is a similar mechanism to that proposed for the amphibolite suite, except that in the Frost & Frost (1997) model, an asthenospheric source is required for the initial intrusion of tholeiitic basic magmas into the base of the crust. In the model proposed here an asthenospheric mantle is required for heating but not for the source; the tholeiitic source is derived from dehydrating of normal depleted mantle arc magmas.

A-type granites are commonly associated with extensional and 'anorogenic' settings (Windley 1993; Bonin 2007). This study has indicated the formation of A-type magmas in an arc setting; this has previously been recorded in Proterozoic arc settings (e.g. Slagstad et al. 2004; Zhao et al. 2008). In the Mesoproterozoic Muskoka domain in the Grenville province, Slagstad et al. (2004) suggest intra-arc extension has allowed the sourcing of asthenospheric mantle for formation of tholeiitic

parent magmas. In a Neoproterozoic arc on the edge of the Yangtze block, Zhao et al. (2008) suggest A-type plutons have formed by remelting of TTG-type crust that has been dried out (i.e. charnockitisation), by sustained heating from a magmatic underplate. The model proposed here includes elements of both of these examples, i.e. intra-arc extension, dehydration of mafic crust induced by magmatic underplating, and asthenospheric mantle upwelling to provide further heat for melting of the dehydrated crust.

## 4.6 Conclusions

The major, trace and REE trends within the Sauda Grey Gneiss suite suggest that it formed by multiple stages of fractionation at different levels in the crust, in a deep hot crustal zone setting (Annen et al. 2006). The fact that both ferroan (amphibolites) and magnesian (Grey Gneiss) trends are recorded in upper crustal intrusive rocks, suggests that melts were able to fractionate in relatively closed-systems. However, in this hot crustal environment, it is likely that some magma batches underwent mixing; the magma mingling seen in the field is evidence of mafic magmas intruding more felsic magma bodies. Partial melting of crystallised magma bodies by the heat of later intrusions may occur in this environment. The production of evolved rocks via fractional crystallisation requires large volumes of residual cumulate rocks to be produced. These may be present in the lower crust, but also may have been returned to the mantle (Kay & Kay 1985; Arndt & Goldstein 1989).

The geochemistry of the magma suites suggests formation in a volcanic arc setting. The degree of LREE enrichment is significantly greater than that observed in oceanic island arcs (e.g. Talkeetna, Clift et al. 2005; Greene et al. 2006), and complete differentiation from mafic to felsic compositions requires a greater differentiation column than typical oceanic island arcs. Thus, the Suldal arc probably developed on thickened crust, such as in a mature island arc or continental arc. However, the geochemistry of the arc rocks is compatible with fractional crystallisation of mantle-derived basalt in relatively closed-systems, without obvious assimilation of previously formed crust. Although the data cannot exclude the existence of pre-existing crust, they do not require it. Bimodal continental rift magmatism in the adjacent Telemark Sector, occurring contemporaneously with arc magmatism in the Suldal Sector, suggests that the crust was undergoing extension during the ~1.5 Ga period. Thus, a thin ensiliac crust is interpreted to be the most likely candidate for the substrate of the Suldal Arc. Arcs developed on ensiliac crust can occur outboard of continental shields as continental ribbons, or on attenuated parts of continental crust; both of these features are typical of retreating accretionary orogens (Cawood et al. 2009).

Highly iron-enriched tholeiitic magma series were able to differentiate during the evolution of the Suldal arc. Such compositions are rare in the rock record, and in continental settings are typically

related to anorogenic plume-related magmatism. The formation of such compositions is postulated to be a function of very dry and reducing conditions existing during magma differentiation; the cause of such conditions in a supra-subduction setting is anomalous, but linked to dehydration and subsequent melting, both possibly as a consequence of asthenospheric mantle upwelling that produced coeval continental rift magmatism in the adjacent Telemark Sector.

Table 4.1. Results of Rayleigh fractional crystallisation modelling of REE contents in the Sauda Grey Gneiss. Each successive melt is modelled at 20% fractional crystallisation. Partition coefficients from Arth (1976), Fujimaki et al. (1984), Dostal et al. (1983), Shock (1979), Gill (1981) and Philpotts & Schnetzler (1970).

Decelt 60.22 57.20 44.21 21.12 22.20 18.71 15.25 12.07 12	
$ \begin{array}{c} \text{Dasan} \\ \text{o} 0.32  57.30  44.51  51.12  25.20  18.71  15.25  13.97  12 \\ \end{array} $	82 13.44
Andesite 98.21 80.38 53.21 35.42 24.23 21.73 18.25 16.51 15	40 15.98
Dacite 127.46 102.46 65.42 41.14 21.71 24.86 20.09 18.78 17	13 17.22
Plagioclase 0.148 0.111 0.090 0.039 1.126 0.031 0.023 0.020 0.0	23 0.019
$\overline{}$ Olivine 0.007 0.006 0.006 0.007 0.007 0.010 0.013 0.026 0.0	49 0.045
$\overset{50}{32}$ Clinopyroxene 0.056 0.150 0.310 0.500 0.510 0.610 0.680 0.650 0.6	20 0.560
Hornblende 0.250 0.843 1.340 1.804 1.200 2.017 2.024 1.740 1.0	42 1.563
Magnetite 1.500 1.500 3.000 3.000 2.000 1.000 1.000 1.000 1.000	00 1.000
Plagioclase 0.302 0.221 0.149 0.102 1.214 0.067 0.050 0.045 0.0	41 0.046
Olivine 0.007 0.006 0.006 0.007 0.007 0.010 0.013 0.026 0.0	49 0.045
Clinopyroxene 0.056 0.508 0.645 0.954 0.681 1.350 1.460 1.330 1.3	00 1.200
Hornblende $0.544$ $0.843$ $1.340$ $1.804$ $1.557$ $2.017$ $2.024$ $1.740$ $1.60$	42 1.563
	50 0.250
Apatite 20.00 34.70 57.10 62.80 30.40 56.30 50.70 37.20 23	90 20.00
Modellad malts 72.60 67.05 49.99 34.18 23.27 20.41 16.58 15.41 14	23 15.03
87.38 78.45 56.39 37.53 23.35 22.27 18.02 17.00 15	79 16.81
105.17 91.80 63.62 41.21 23.42 24.29 19.58 18.75 17	52 18.80
Modellad malta 114.30 91.13 59.40 38.13 23.01 22.87 19.18 17.74 16	70 17.47
Stars 2 133.01 103.33 66.31 41.03 21.84 24.07 20.15 19.06 18	10 19.09
Stage 2 154.79 117.15 74.03 44.16 20.74 25.34 21.17 20.47 19	62 20.87

## Continental recycling in arc magmas: Hf-O isotope constraints on Telemarkian (1.52-1.48 Ga) magmatism

Aim - In this chapter, zircon Hf and O isotope data from various arc-type lithologies from the Suldal Sector are presented. The data are used to constrain the possible crustal and mantle components that have contributed to  $\sim$ 1.5 Ga arc magmatism in Telemarkia, and deduce the amount of continental growth that has occurred during this magmatic episode.

## 5.1 Introduction

Recent advances in the in-situ measurement of isotopes in the accessory mineral zircon have lead to its common use as a tool for refining the petrogenesis of igneous rocks (e.g. Hawkesworth & Kemp 2006). The ability to measure both hafnium and oxygen isotopes on zircon grains that have also been dated by U-Pb, allows for the discrimination of multiple magmatic sources that typically cannot be constrained using whole-rock methods. For example, U-Pb zircon ages can point to older crustal contaminants that have added inherited zircons to a magma, Hf isotopes can be used to determine the crustal residence age of the magma that a zircon crystallised in, and oxygen isotopes can be used to constrain where older components were recycled into the magma (in the mantle or in the crust).

The recycling of pre-existing continental crust, including sedimentary material, to arc magmas has long been recognized (e.g. Armstrong 1971; Hildreth & Moorbath 1988; Plank & Langmuir 1993). Numerous studies have sought to constrain whether continental crust has been recycled into the arc magmas in the mantle, via subduction of sediments, or in the crust, via contamination and assimilation (e.g. Hawkesworth et al. 1979; Thirlwall & Graham 1984; Gasparon et al. 1994). Both of these processes likely occur together in the same subduction zone; however it is useful to discriminate between them to determine the volume and rate that previously formed continental crust is being recycled. The end-member processes are termed mantle recycling and intracrustal recycling; the latter can be broken down into infracrustal recycling, whereby previously formed igneous crust (such as ancient underplated material) is recycled into the magma. Studies aiming at differentiating these processes have commonly combined radiogenic isotopes (e.g. Sr, Nd, Hf) with a stable isotope (O) (e.g. James 1981; Davidson 1985).

Determining the mantle versus crustal input to different granitoid types in different geodynamic settings has long been a focus of petrogenetic studies. The geochemical classification of granitoid suites is commonly used to infer tectonic settings and/or mantle versus crustal sources. For example, with the alphabet classification scheme (Chappell & White 1974), I-type granites typically

have an inferred igneous and/or mantle source and occur in arc settings, S-type granites have inferred sedimentary sources and occur in collisional settings, and A-types have inferred mantle or mixed sources and occur in anorogenic sources (see reviews by Barbarin 1999; Frost et al. 2001). However, recent studies combining zircon U-Pb, Hf and O, have demonstrated that both sedimentary and mantle material have been involved in the petrogenesis of all of these granite types in a variety of settings (e.g. I-type, Kemp et al. 2007; S-type, Appleby et al. 2009; A-type granites, Be'eri-Shlevin et al. 2009). Thus, granitoids with a variety of geochemical signatures and in a variety of tectonic settings may involve both recycling of previously formed continental crust and formation of new crust by juvenile mantle input.

The crystalline basement in SW Fennoscandia comprises various Palaeo- to Mesoproterozoic terranes that comprise deformed plutonic and volcanic arc-like lithologies, and have been reworked during the Sveconorwegian (Grenvillian) and Caledonian orogenies (e.g. Gaál & Gorbatschev, 1987; Bingen et al. 2008a). The evolution of the ~1.7 to 1.5 Ga crust can be described by two endmember models: 1) where Palaeoproterozoic crust underlies the entire region and has been recycled during younger magmatic episodes (Andersen et al. 2002b, 2004a, 2009b), or 2) where the various terranes represent accreted juvenile arcs with limited contribution from older material (Brewer et al. 1998; Åhäll & Connelly 2008). Various isotope data point to a contribution from Palaeoproterozoic crust to Gothian (~1.7-1.55 Ga) and younger magmatism (1.2-0.93 Ga; Andersen 1997, 2001, 2002b, 2004a, 2007b, 2009b; Andersen & Griffin 2004), but the lack of isotope data from ~1.5 Ga Telemarkian crust hinders the testing of the above models; to resolve this, this study presents U-Pb, Hf and O data from Telemarkian (~1.5 Ga) magmatic rocks in the Suldal Sector, which are used to constrain if and what older crust has been recycled during their petrogenesis.

## 5.2 Geological Setting

The Fennoscandian Shield comprises an Archaean core in the northwest; surrounding this are younger arcs and microcontinents that amalgamated during the Svecofennian orogeny at ~ 2.1-1.9 Ga (Korja et al. 2006; Lahtinen et al. 2009). At ~1.85 Ga a subduction zone initiated on the southwest margin (present-day position) of the continent, producing the Transcandinavian Igneous Belt (TIB; see Högdahl et al. 2004). The terranes to the southwest of the TIB that comprise the Southwest Scandinavian Domain (SSD), can be interpreted as forming in continental and island arcs along a long-lived subduction margin that progressively moved away from the Fennoscandian continent (Åhäll & Connelly 2008), in a retreating accretionary orogen (Cawood et al. 2009).

The SSD comprises terranes (senso lato) aged  $\sim$ 1.69 to 1.48 Ga that progressively young to the west. The youngest of these, Telemarkia, makes up the crust west of the Oslo Rift (Bingen et al. 2005b). The oldest identified igneous unit within Telemarkia is the 1.55 Ga Åsen metatonalite

(Pedersen et al. 2009); this is the only unit older than 1.52 Ga, and its origin remains uncertain. The main continental growth episode of the Telemarkia terrane is defined as 1.52-1.48 Ga (Bingen et al. 2005b; 2008a), and is known from dating plutonic and volcanic orthogneisses from across the region. Other major tectonostratigraphic units within Telemarkia include the ~1.5 Ga Vestfjorddalen supergroup which has been related to continental extension behind a subduction margin (Slagstad et al. 2009), supracrustal sequences dated at 1260-1220 and 1170–1140 Ma that are also related to extensional settings behind a subduction margin (Bingen et al. 2002; Brewer et al. 2004), and early- to late-Sveconorwegian intrusions dated between 1.05 and 0.93 Ga (Andersen et al. 2002a, 2007a; Bingen & van Breemen 1998; Schärer et al. 1996). Various sedimentary units within Telemarkia that were deposited between ~1.6 and 1.1 Ga, comprise Palaeoproterozoic and late Archaean detrital zircons (Åhäll et al. 1998; de Haas et al. 1999; Bingen et al. 2001b, 2003); this suggests that during the Mesoproterozoic the terrane was located near to an older continent.



Figure 5.1. A) Lithotectonic domains of SW Fennoscandia. Ha = Hardangervidda Sector, Su = Suldal Sector, RVA = Rogaland Vest-Agder Sector, Tele = Telemark Sector, K = Kongsberg terrane, MZ = Mylonite Zone, MUSZ = Mandal-Ustaoset Shear Zone. B) Geological sketchmap showing the sample localities from the Suldal Sector along with U-Pb ages and average Hf and O isotope values. (Modified from Bingen et al. 2005b).

The samples in this study are taken from the Suldal Sector in and around the Sauda and Suldal communes (Figure 5.1), except for one sample from further south in the Rogaland Vest-Agder Sector. The basement in these areas comprises variably fine to coarse-grained lithologies metamorphosed in amphibolite-facies, and that are interpreted to represent different exposures through an arc complex (Chapter 2). The geochemistry of these lithologies is compatible with formation in an arc setting via fractional crystallisation of mantle-derived mafic melts (Chapter 4). Brief sample descriptions are given in Table 5.1; further details of samples collected within this study (SAX-XX sample number), are provided in Chapter 3. Separated zircons have a range of morphologies, but are generally prismatic, oscillatory-zone and elongate, as is typical of igneous zircons (Figure 5.2). The more mafic lithologies (SA7-86 and ROG525) exhibit larger zircons which were fragmented during separation, and feature less distinct oscillatory-zoning or are sector zoned. Distinctive core and rim/overgrowth relationships are lacking in all samples; discontinuities in zoning do exist in some grains, but the style of zoning across these is similar, suggesting an origin related to replenishment of magma during crystallisation, as opposed to overgrowth on inherited zircons. U-Pb ages where obtained from multiple growth zones are similar in age also (see Chapter 3; Slagstad & Marker 2009, unpublished data).



Figure 5.2. CL images of selected zircons showing position of individual U-Pb, Hf and O analyses.

Table 5.1. Sample descriptions. <sup>a</sup> U-Pb dating by LA-ICP-MS/TIMS at NIGL, Nottingham (Chapter 3); <sup>b</sup> U-Pb dating by Ion-
microprobe at NORDSIM, Stockholm (Slagstad & Marker, unpublished data); <sup>c</sup> U-Pb dating by LA-ICP-MS at Norwegian
Geological Survey, Trondheim (Slagtad & Marker, unpublished data). Tzr-C = zircon saturation temperature (Watson &
Harrison 1983), calculated from whole-rock geochemical data in table 10.x.

Sample	Unit	Lithology	Deformation	<b>Field relations</b>	$T_{Zr} \ ^{\circ}C$
$SA3-04^{a}$ $1509 \pm 6$	Sauda Grey Gneiss Complex	Coarse-grained porphyritic felsic gneiss	Strongly deformed	Wide (>100m) unit within a region on strongly sheared porphyritic gneisses	781
$\begin{array}{c} \text{SA3-60}^{\text{a}} \\ 1518 \pm 6 \end{array}$	Sauda Grey Gneiss Complex	Light grey fine- grained felsic gneiss	Strongly deformed	Narrow (<20m) unit within a heterogeneous body of mafic to felsic gneisses	859
$SA7-04^{a}$ 1497 ± 22	Zinc Mine Banded Gneiss	Light grey fine- grained felsic gneiss	Strongly deformed	Narrow (<20m) unit within heterogeneous banded gneiss sequence	727
SA7-130 <sup>a</sup> 1511 ± 3	Sauda Grey Gneiss Complex	Grey fine-grained banded gneiss	Strongly deformed	Felsic unit from a bimodal gneiss sequence that is disrupted by Sveconorwegian granitoids	850
$SA7-86^{a}$ $1498 \pm 2$	Amphibolites	Pegmatitic zone of hornblende gabbro	Weakly deformed	Coarse-grained part of a heterogeneous mafic body (~1km wide)	812
$SA7-91^{a}$ 1503 ± 1	Sauda Grey Gneiss Complex	Medium-grained biotite granite	Undeformed	Massive granite body that intrudes more deformed and heterogeneous gneisses	854
$MM2235^{b}$ 1484 ± 10	Sauda Grey Gneiss Complex	Grey fine-grained biotite gneiss	Strongly deformed	Narrow (<10m) unit within heterogeneous banded gneiss sequence	771
$\begin{array}{c} MM2241^{b}\\ 1486\pm6 \end{array}$	Sauda Grey Gneiss Complex	Grey fine-grained biotite gneiss	Strongly deformed	Narrow (<10m) unit within heterogeneous banded gneiss sequence	807
$\begin{array}{c} ROG525^{b} \\ 1504 \pm 4 \end{array}$	Amphibolites	Medium-grained hornblende gabbro	Undeformed	Mafic body, contacts not observed	n/a
$\begin{array}{c} MM36676^{b} \\ 1495 \pm 7 \end{array}$	Amphibolites	Coarse-grained hornblende granite	Weakly deformed	Intrusive sheets in gabbro (ROG525)	712
MM36631 <sup>b</sup> 1521 ± 6	Sauda Grey Gneiss Complex	Light grey fine- grained felsic gneiss	Strongly deformed	Narrow (<20m) unit within heterogeneous banded gneiss sequence	n/a
Ro-102B <sup>c</sup> 1503 ± 21	Undefined (gneiss complex)	Grey migmatitic felsic gneiss	Strongly deformed	Narrow (<10m) unit within heterogeneous banded gneiss sequence	n/a

## 5.3 Analytical Methods

#### 5.3.1 Zircon U-Pb isotopes

Zircons were analysed either by LA-ICP-MS at the NERC Isotope Geosciences Laboratory, UK, (data presented in chapter 3), or by ion microprobe at the NORDSIM facility, Sweden (unpublished data; Slagstad & Marker 2009). <sup>207</sup>Pb/<sup>206</sup>Pb ages are given in Table 10.18.

#### 5.3.2 Zircon Hf isotopes

Lu-Hf isotope analyses were determined at the NERC Isotope Geosciences Laboratory, UK, using a Nu-Plasma HR MC-ICP-MS coupled to a 193 nm solid state (UP193SS, New Wave Research) laser ablation system. Helium gas was added to the laser ablation cell, and argon gas was added after ablation via a NU-Plasma DSN-100 desolvating nebuliser, whilst aspirating a 2% HNO<sub>3</sub> +0.1 molar Hf acid solution to help maintain constant plasma conditions.

The analyses were performed on zircons mounted in epoxy blocks; all mounts were cleaned with weak acid before Hf analysis, and mounts that had been used for SIMS analyses had their gold coating removed prior to cleaning. Analyses were carried out on top of the ion-microprobe or laser-ablation pit when possible, so that Hf analysis could be paired with the dated portion of the zircon.

The isotopes <sup>173</sup>Yb, <sup>174</sup>(Yb, Hf), <sup>175</sup>Lu, <sup>176</sup>(Yb, Lu, Hf), <sup>177</sup>Hf, <sup>178</sup>Hf, and <sup>179</sup>Hf were measured on Faraday cups in a static sequence. The isobaric interference of <sup>176</sup>Yb was corrected using the method of Nowell & Parrish (2001); JMC475 Hf standard solutions were measured prior to each analytical session which were variably doped with Yb (0 to 40ppb), the true value of <sup>176</sup>Yb/<sup>173</sup>Yb is then calculated using a regression. This true <sup>176</sup>Yb/<sup>173</sup>Yb value is used to subtract <sup>176</sup>Yb from the 176 peak. The interference of <sup>176</sup>Lu on <sup>176</sup>Hf was corrected by measuring the interference-free <sup>175</sup>Lu isotope and using a value of 0.02653. Corrections were applied during each analysis after an inverse mass bias correction using the measured <sup>179</sup>Hf/<sup>177</sup>Hf ratio, this allows for absolute differences between the Hf and Yb mass bias. The <sup>178</sup>Hf/<sup>177</sup>Hf stable isotope ratio is used to monitor data quality.

A spot diameter of 50  $\mu$ m, 10 Hz repetition rate and ablation time of 60 seconds were used, resulting in total Hf signals of 5 to 9V. All data were normalised to the <sup>176</sup>Hf/<sup>177</sup>Hf of the JMC475 reference solution assuming a value of 0.282160. The <sup>176</sup>Lu/<sup>177</sup>Hf ratio was normalised to the reference material using values of 0.000311 for 91500 and 0.000042 for Mud Tank (Woodhead & Hergt 2005). Data were reduced off-line using time-resolved analyses; this allows for the selection of stable portions of analyses and the identification of ablation through different growth zones or into the epoxy mount. All uncertainty components, including those for age and normalisation, were factored into the final uncertainty quoted. Analytical uncertainties for unknowns were propagated by quadratic addition to include the standard error of the mean of the analysis and the

reproducibility of the primary ablation reference material. The reproducibility of the standards was better than 1 epsilon unit; the final analytical uncertainty of the unknowns is typically between 1 and 2 epsilon units.



Figure 5.3. Reproducability of the <sup>176</sup>Hf/<sup>177</sup>Hf ratio in secondary standards across all of the analytical sessions. Recommended values from Jackson et al. (2004), Woodhead & Hergt (2005) and Sláma et al. (2008).

Hf analyses were conducted on concordant (>95 % concordance) grains where possible; less than 10% of the data are obtained on discordant grains. The  ${}^{176}\text{Hf}/{}^{177}\text{Hf}_{initial}$  value measured on discordant grains is within error of the average  ${}^{176}\text{Hf}/{}^{177}\text{Hf}_{initial}$  of the sample, indicating that any disturbance of the Lu-Hf system during events that have caused lead-loss is neglible, and thus that the spread in  ${}^{176}\text{Hf}/{}^{177}\text{Hf}_{initial}$  within each sample does not represent metamorphic disturbance.

During analytical sessions in 2009, the measured  ${}^{178}$ Hf/ ${}^{177}$ Hf ratio was sometimes below the recommended value (1.4723; Patchett & Tatsumoto 1981). In some samples  ${}^{176}$ Hf/ ${}^{177}$ Hf<sub>initial</sub> correlates with  ${}^{178}$ Hf/ ${}^{177}$ Hf, whereas in other samples  ${}^{176}$ Hf/ ${}^{177}$ Hf<sub>initial</sub> seems unaffected (Table 10.18). The analyses where the  ${}^{178}$ Hf/ ${}^{177}$ Hf ratio is significantly low have  ${}^{176}$ Hf/ ${}^{177}$ Hf<sub>initial</sub> values that are within analytical uncertainty (2 $\sigma$ ) of the sample mean; thus these data have not been rejected, but it is worth noting that the total range in  $\epsilon$ Hf for some samples maybe over estimated due to this analytical error.

Epsilon Hf values were calculated using the decay constant  $\lambda$ (<sup>176</sup>Lu)=1.867\*10<sup>-11</sup> (Söderlund et al. 2004), CHUR parameters of Bouvier et al. (2008), and the depleted mantle model (DM) of Griffin

et al. (2000); the depleted mantle model of Pietranik et al. (2009) is also shown in figure 5.7 for comparison. Model ages are calculated using  $^{207}$ Pb/ $^{206}$ Pb ages with  $^{176}$ Hf/ $^{177}$ Hf<sub>initial</sub> and  $^{176}$ Lu/ $^{177}$ Hf ratios. The Lu/Hf ratio in a zircon is typically much lower than that of the magma that the zircon crystallised in, therefore, single-stage model ages calculated using the Lu/Hf of the zircon (T<sub>DMZ</sub>) will be erroneously low. An alternative method is to calculate a two-stage model age using the Lu/Hf ratio of the whole-rock from which the zircon was extracted, as this provides a best estimate for the Lu/Hf of the magma. Whole-rock measurements were not made during this study, thus, known average Lu/Hf ratios of crustal reservoirs can be used instead. Commonly used ratios include 0.022 for mafic crust (Vervoort & Patchett 1996), 0.093 for felsic crust (Amelin et al. 1999), and 0.015 for average continental crust (Griffin et al. 2000). In this study, two-stage model ages are presented using a Lu/Hf of 0.015 (T<sub>DMC</sub>).

#### 5.3.3 Zircon oxygen isotopes

Oxygen isotope data were obtained at the University of Edinburgh, UK, using a Cameca ims-1270 ion microprobe following methods outlined in Appleby et al. (2009) and Kemp et al. (2007). Analysed zircons were mounted in epoxy blocks, cleaned in weak acid and gold-coated. The analyses were conducted after U-Pb and Hf analyses, so the mounts were lightly polished using diamond paste to remove any significant topography caused by previous ablation.

A 6nA primary <sup>133</sup>Cs<sup>+</sup> ion beam with a diameter of ~20  $\mu$ m was used, with the charge being neutralised using a normal-incidence electron flood gun. Secondary ions were extracted at 10kV. <sup>18</sup>O<sup>-</sup> and <sup>16</sup>O<sup>-</sup> ions were measured simultaneously on dual Faraday cups. Each analysis involved presputtering for 50 seconds, followed by data collection in 10 cycles, with 4 seconds of acquisition per cycle. The secondary yield of <sup>18</sup>O was typically between 5\*10<sup>6</sup> and 8\*10<sup>6</sup> counts per second.



Figure 5.4. Reproducability of  $\delta^{18}$ O in the 91500 primary standard across the analytical session. Recommended value from Valley (2003).

To correct for instrumental mass bias and instrumental drift all data were normalised to 91500 ( $\delta^{18}$ O = 10.07 ± 0.03‰; Valley 2003). This standard zircon was analysed in blocks of 5 to 10 after every 10 to 20 analyses of unknowns. The beginning of each analytical session involved measurement of 40-60 analyses of a combination of 91500 and in-house standards (KIM/Temora). The unknown analyses were normalised to the daily average <sup>18</sup>O/<sup>16</sup>O value obtained for 91500, or if instrumental drift was recognised, the data were normalised to the linearly interpolated <sup>18</sup>O/<sup>16</sup>O value derived from analyses of the bracketing 91500 standard. The external precision based on analysis of the standard was 0.69‰ (2 $\sigma$ ) across the whole analytical session (Figure 5.4). This value is used as the final uncertainty on the unknowns as it gives the most conservative estimate of the uncertainty.

## 5.4 Results

#### 5.4.1 Zircon Hf isotopes

The results of the Hf analyses are plotted in Figure 5.5. Each sample has a mean value falling between CHUR and depleted mantle (DM); the total  $\epsilon$ Hf range across the samples is from ~-1 to +10. The range in  $\epsilon$ Hf for each sample varies from ~1.5 to 6 epsilon units (MSWD 0.4 to 5); for some of the samples this range is within analytical uncertainty (MM36631, MM36676, SA3-60, SA7-91; MSWD 0.4 to 1.4). None of the samples have outliers which are not within error ( $2\sigma$ ) of other analyses within the sample population. 20 of the analyses lack U-Pb data from the analysed zircon; however, the U-Pb data from these samples suggests the zircons represent single igneous populations (Chapter 3), and therefore the intrusion age provides a robust estimate for the age of crystallisation of the zircons. The lack of anomalously low  ${}^{176}$ Hf/ ${}^{177}$ Hf<sub>initial</sub> values in any of the samples, suggests that none of the analysis were conducted on grains inherited from much older crust (>300 Myrs).

Multiple Hf analyses from the same zircon grain are within analytical uncertainty of each other (see Figure 5.2 & Table 10.18); the maximum variation between multiple analyses that are aimed at the same portion of zircon is 2.03 epsilon units with an average variation of only 0.76 epsilon units (n=11), the maximum variation between analyses on different parts of the same zircon grain is 1.89 epsilon units with a average of 0.96 epsilon units (n=8). Thus, in this dataset there is no evidence for variation between outer and inner zircon zones, suggesting little evolving heterogeneity in the magmas, in contrast to selected previous studies (Kemp et al. 2007; Appleby et al. 2008; Be'eri Shlevin et al. 2009).

The data exhibit a subtle temporal correlation, with  $\epsilon$ Hf decreasing with decreasing intrusion age (Figure 5.5). The data do not exhibit a clear correlation between  $\epsilon$ Hf and SiO<sub>2</sub>, the latter being used to represent the degree of magma differentiation. The two most mafic samples (ROG525 and SA7-86) have mean  $\epsilon$ Hf values of ~+6 and ~+5.5 respectively, which are similar to the mean values of the most differentiated samples (SA7-91, SA3-60). The most enriched (lowest  $\epsilon$ Hf) samples are Ro-

102B (migmatitic grey gneiss), SA3-04 (porphyritic granodiorite), and MM2235 and MM2241 (dacitic quartz-feldspar gneisses).

Two-stage model ages using a Lu/Hf of 0.015 ( $T_{DMC}$ ) for the samples range from 1530 to 2173 Ma, with the average of each sample ranging from 1611 to 2016 Ma. The model ages are ~100 to 500 million years older than the intrusion ages.



Figure 5.5. Results of in-situ Hf analyses. (A)  $\epsilon$ Hf<sub>(initial)</sub> plotted against arbitary units, for each sample the weighted mean and 2s.e. are shown as a black solid line and block dotted lines respectively. (B)  $\epsilon$ Hf<sub>(initial)</sub> versus the intrusion age of the sample. Error bars are 2s.d. of the mean (C)  $\epsilon$ Hf<sub>(initial)</sub> versus whole-rock SiO<sub>2</sub>. Error bars are 2s.d. of the mean. DM is depleted mantle model of Griffin et al. (2000) and CHUR uses values according to Bouvier et al. (2008).

#### 5.4.2 Zircon oxygen isotopes

A subset of 8 samples were analysed for  $\delta^{18}$ O (Figure 5.6). The average  $\delta^{18}$ O of each sample varies from +5.43 ± 0.9 to +8.65 ± 1.15 ‰. Five of the samples have variation which does not exceed analytical uncertainty (ROG525, SA3-04, SA3-60, SA7-86, SA7-91; MSWD = 0.7 to 1.7), and two of the samples have variation slightly outside of the analytical uncertainty suggesting real

geological heterogeneity (MM2235, MM2241; MSWD = 2.8 & 3.3). One sample (SA7-04) exhibits a significant range in  $\delta^{18}$ O (MSWD = 22); this sample has been affected by lead-loss (see Chapter 3), has metamict and/or alteration textures visible in CL (Figure 5.2), and under normal light the zircons have an opaque milky colour. The sample was taken from near the contact with a Sveconorwegian granite which features hydrothermal mineralisation, thus, it is suggested that the variation in  $\delta^{18}$ O within this sample may represent post-crystallisation alteration.

Multiple  $\delta^{18}$ O ratios measured on the same zircon grain have variation of up to 1.01 ‰, which is slightly outside of analytical uncertainty (± 0.69 ‰), these multiple analyses were not conducted on distinguishable growth zones; such analysis of clearly different growth zones was hampered by the limited availability of material to analyse. As with the Hf analyses, the O isotopes do not exhibit a clear correlation with SiO<sub>2</sub> (Figure 5.6). The sample closest to the mantle value (5.3 ± 0.3 ‰) is a granite (SA7-91), samples with averages above the mantle value are dioritic (ROG525, SA7-86) to rhyolitic (SA3-60, MM2241), and the highest mean  $\delta^{18}$ O belongs to a dacitic gneiss (MM2235).



Figure 5.6. Results of in-situ oxygen analyses. (A)  $\delta^{18}$ O VSMOW<sub>(zircon)</sub> plotted against arbitary units; for each sample the weighted mean and 2s.e. are shown as a black line and block dotted lines respectively. (B)  $\delta^{18}$ O VSMOW<sub>(zircon)</sub> versus whole-rock SiO<sub>2</sub>. Error bars are 2s.d. of the mean. DM is depleted mantle model of Griffin et al. (2000) and CHUR values are from Bouvier et al. (2008). Symbols as in figure 5.5.

## 5.5 Discussion

Before discussing the possible mantle and crustal contributions to Telemarkian magmatism, constraints from previous studies are evaluated.

#### 5.5.1 Previous isotopic constraints

Whole-rock Sm-Nd data exist for a number of different magmatic suites within SW Fennoscandia. The Trossovdal rhyolite formation in the Sæsvatn-Valldal supracrustal belt (Suldal Sector), is postulated to have formed by crustal anatexis in a back-arc setting by mafic underplating and asthenospheric uprise (Brewer et al. 2004); whole-rock Sm-Nd analyses constrain ɛNd at 1260 Ma to be 0.6 and -3.3, equivalent to model ages of 1730 and 2000 Ma (Brewer et al. 2004). The Tuddall rhyolite formation of the Vestfjorddalen supergroup (Telemark Sector), also formed by crustal anatexis as a consequence of mafic underplating and asthenospheric uprise (Menuge & Brewer 1996); whole-rock Sm-Nd analyses give a range of model ages from 1506 to 1779 Ma. Late Gothian granitoids in the Bamble-Kongsberg and Idefjorden terranes intruding at 1522 to 1615 Ma (Hisingen Suite and Göteborg-Åmål Belt; Figure 5.7), have Nd model ages of 1570 to 1760 Ma (Andersen et al. 2002b). Late-Sveconorwegian granitoids from across SW Fennoscandia have Nd model ages in the range of 1300-1600 Ma (Andersen et al. 2001). By combining Nd with Sr and Pb isotopes, Andersen et al. (1997, 2001), have constrained the composition of a crustal component that they suggest has been involved in the source of Sveconorwegian intrusions, as well as in earlier 1.5 to 1.2 Ga magmatic suites (Andersen et al. 2002b, 2007b, 2009b; Andersen & Griffin 2004). This crustal component, termed the 'normal deep crust' (see Andersen et al. 2001), is regarded to be moderately LILE-enriched (i.e. similar to upper crust composition) and at least 1.7 Ga age.



Figure 5.7. Time (Ma) versus  $\epsilon$ Hf<sub>(initial)</sub> for zircons from SW Fennoscandia. Telemarkian data from this study; Hisingen and GAB are calc-alkaline granitoids from the Bamble, Kongsberg and Idefjorden terranes (Andersen et al. 2002b, 2004a); metagreywacke and metapelite zircons are from units deposited at ~1550 Ma in the Idefjorden terrane (Andersen et al. 2004a); TIB data are granitoids from the Transcandinavian Igneous Belt (Andersen et al. 2009a). Mantle and crustal end-members are those discussed in the text. The grey bar represent the evolution of TIB granitoids using Lu/Hf = 0.015.

In-situ Hf zircon analyses have been conducted on ~0.93-1.1 Ga Sveconorwegian intrusions from across Telemarkia, ~1.3-1.2 gneisses in the Telemark Sector, ~1.52-1.62 Ga calc-alkaline granites in the Bamble-Kongsberg and Idefjorden terranes, and ~1.85-1.66 Ga Transcandinavian Igneous Belt granitoids (Andersen et al. 2002b, 2004a, 2007b, 2009a, 2009b; Andersen & Griffin 2004;

Pedersen et al. 2009). The  $\epsilon$ Hf of the ~1.52-1.66 Ga granitoids is close to that of the depleted mantle, suggesting limited involvement of older crust (see Figure 5.7). The  $\epsilon$ Hf of <1.5 Ga magmatic rocks is compatible with mixing between depleted mantle and a source equivalent to the ~1.52-1.62 Ga granitoids. A few inherited zircons in Sveconorwegian granites, some of which are Palaeoproterozoic in age, have relatively low  $\epsilon$ Hf, and therefore cannot be produced by remelting of 1.52-1.62 Ga crust alone; these have been cited as evidence for the existence of Palaeoproterozoic crust at depth underlying southern Norway (Andersen et al. 2002b, 2009b; Andersen & Griffin 2004; Pedersen et al. 2009).

Scherstén (2002) provide the least equivocal evidence for older crust at depth, with a Re-Os age of 1887 Ma for an ultramafic lens within the Mylonite Zone that divides the Eastern Segment (comprising reworked 1.6-1.7 Ga TIB crust) from the Idefjorden terrane (1.66-1.55 Ga crust). However, this indicates that ~1.9 Ga crust may reside at depth below younger ~1.7 Ga TIB crust, but does provide evidence for older crust underlying the Telemarkia terrane.

#### 5.5.2 Zircon inheritance

The issue of inherited zircons and their origin is important, since such evidence has been used in other accretionary orogens to infer older crust existing at depth; by doing this, the interpreted amount of continental growth versus the amount of continental recycling in these accretionary orogens is dramatically decreased. Examples include the 1.7-1.8 Ga Yavapai-Mazatzal province in Laurentia (Hill & Bickford 2001), the Central Asian Orogenic Belt (Kröner et al. 2007), and the Arabian-Nubian Shield (Hargrove et al. 2006; Ali et al. 2009b). However, whether such inherited zircons can be used to infer an older deep crust is a matter of contention, for example, older zircon 'only indicates the presence of older zircons, not the presence of extensive tracts of older crust' (from a discussion in Liégeois & Stern 2010 centred on the Arabian-Nubian Shield). Liégeois & Stern (2010) suggest that because zircons are stable in the mantle, they can be introduced into juvenile magmas through a number of ways, including delamination of older crust itself. Glacial deposits have also been cited as a method of introducing older zircons onto juvenile crust (e.g. Ali et al. 2009a).

As previously stated, Sveconorwegian granitoids within Telemarkia contain some Palaeoproterozoic inherited zircons. These Sveconorwegian granitoids intrude Telemarkian basement that lack inherited zircon (see Chapter 3). Although the existence of inherited zircons has commonly been used as evidence for assimilation of older crust, the lack of inherited zircons does not indicate the non-existence of older crust.

If a magma is hot enough (typically greater than 850°C; Watson 1996), then any zircon assimilated will dissolve unless suitably large in size (>120  $\mu$ m radius); the temperature that zircon can crystallize at is dependent on the zirconium concentration of the melt (T<sub>Zr</sub>; Watson & Harrison 1983). A study by Miller et al. (2003) showed that inheritance-rich granitoids have a mean T<sub>Zr</sub> of 766°C, whereas inheritance-poor granitoids have a mean of 837°C. The T<sub>Zr</sub> of the samples in this study is variable, ranging from 712 to 859°C (Table 5.1), and spans the range of both inheritance-poor and inheritance-rich granitoids. However, Kemp et al. (2005) concluded that T<sub>Zr</sub> was unreliable at estimating the initial temperature of magma bodies, and showed that low T<sub>Zr</sub> in evolved compositions may be an underestimate, and reflect fractional crystallisation from zircon-undersaturated melts, such that the magma was initially capable of dissolving zircon, but after fractionation the residual liquids were capable of precipitating zircon.

The general lack of inheritance in the studied Telemarkian rocks can be explained by any crustal input being zircon-free (i.e. dominantly mafic), or that the melts were capable of dissolving any assimilated zircon; however, for the latter to happen in all lithologies with a range of geochemical compositions is considered unlikely. Younger Sveconorwegian intrusions feature Palaeoproterozoic inherited zircons, however, sedimentary rocks within the region have detrital zircon populations that include an abundance of Palaeoproterozoic and sometimes Archaean zircons (de Haas et al. 1999; Bingen et al. 2001b; Andersen et al. 2004b; Åhäll et al. 1998). Therefore, if Sveconorwegian granitoids assimilated such sediments prior to their crystallisation, then the need for Palaeoproterozoic igneous crust at depth is negated. In summary, the evidence from U-Pb zircon ages does not provide significant support for a Palaeoproterozoic deep crust underlying Telemarkia, unless such crust is dominantly mafic and zircon-free.

#### 5.5.3 Geochemical indicator of sources

If significant assimilation of crustal material occurs during differentiation of a magma suite, then this may impart an imprint on the magma suite's geochemistry. Detecting the input of older crust formed in an arc setting to younger arc magmas may be difficult though, especially if metamorphic recrystallisation renders mineral chemistry ineffective. If a magma assimilated, or is a partial melt of a metasedimentary rock, then it will typically be peraluminous in nature; this feature led to the discrimination of S-type granites which are highly peraluminous and have inferred supracrustal sources (Chappell & White 1974). The metaluminous to weakly peraluminous nature of the Telemarkian rocks is more typical of I-type granites, i.e. those that have igneous precursors, and suggests limited involvement of supracrustal sources. However, recent zircon isotope studies in the Lachlan orogen, have shown that supracrustal input to I-type granites can go undetected in wholerock geochemical/isotopic data (Kemp et al. 2007). The geochemistry of the studied Telemarkian rocks suggests formation by fractional crystallization of mafic parent magmas (see Chapter 4); the data do not exclude the assimilation of pre-existing crust, but do not require it.

# 5.5.4 Nature of crustal and mantle components *Zircon Hf isotopes*

The Hf model ages are 100-500 million years older than the crystallisation ages of the samples, suggesting that they did not form purely by intrusion of depleted mantle, but involved contribution from older material, or alternatively mantle that was more chondritic. Involvement of older material can occur via source contamination, whereby subducted sediments mix with depleted mantle, or by crustal contamination, whereby depleted mantle is mixed with older material during differentiation in the crust. Long-term subduction of sediments leads to enrichment of the mantle region, with a migration in composition away from pristine depleted mantle; this can lead to juvenile mantlederived magmas that have an isotope signature that has departed from the depleted mantle. Granitoids that intruded in the Gothian period (Hisingen and GAB suite; Figure 5.7), have EHf values equivalent to the depleted mantle; suggesting that during this time-period the mantle was not significantly enriched. The range of  $\varepsilon$ Hf in the Telemarkian samples is on average lower than that of the Gothian rocks (Figure 5.7), suggesting either an increase in the influence of older subducted sediment, an increase in contamination of older material in the crust, or that the crustal contaminant itself was older. The latter is not expected, since the terranes young to the west, and no older crust is exposed in the Telemarkia terrane. Mixing between depleted mantle and a component similar to Transcandinavian Igneous Belt (TIB) crust can produce the appropriate EHf values of the Telemarkian rocks (Figure 5.7).

### Zircon oxygen isotopes

The mantle is a remarkably homogeneous oxygen isotope reservoir, with igneous zircons formed in equilibrium with the mantle having an average  $\delta^{18}$ O of 5.3 ± 0.3 ‰ (Valley et al. 1998). High magmatic  $\delta^{18}$ O values (>6.5‰) are attributed to melting or assimilation of sediments, altered volcanics, or other supracrustal rocks affected by low-temperature alteration, whereas low magmatic  $\delta^{18}$ O values are attributed to incorporation of material that has undergone high temperature alteration (Valley et al. 2005). Oxygen isotopes can therefore be used to discriminate source contamination (mantle recycling) from crustal contamination (intracrustal recycling), since source contamination will lead to enriched radiogenic isotope signatures, but with oxygen isotopes retaining a mantle signature. The  $\delta^{18}O_{zircon}$  of Telemarkian rocks in this study are well above the range of mantle values (Figure 5.6), suggesting intracrustal recycling and a significant involvement of a component with high- $\delta^{18}O$ .

## Hf-O modelling

The Hf and O data form a binary array in Hf-O space (Figure 5.8), with a low- $\varepsilon$ Hf, high- $\delta^{18}$ O (crustal) end-member and a high- $\varepsilon$ Hf, low- $\delta^{18}$ O (mantle) end-member, thus input of an older crustal component can be modelled by two-component mixing, as has been achieved in previous studies combining Hf-O or Nd-O data (e.g. Peck et al. 2004; Lackey et al. 2005; Kemp et al. 2007). These

previous studies resolved AFC and bulk-mixing curves based on known crustal and mantle endmembers; in this study there is a lack of data to constrain the crustal end-member, as no older crust or metasediments are exposed within the region; however, speculative end-members can be model based on previous whole-rock studies.

The crustal end-member can be constrained by the lowest  $\epsilon Hf_{(1500 \text{ Ma})}$  value (~0) and the highest  $\delta^{18}$ O value (~10), and conversely the mantle-like end-member can be constrained by the highest  $\epsilon Hf_{(1500 \text{ Ma})}$  value (~8.3) and the lowest  $\delta^{18}$ O value (equivalent to the mantle value at ~5.3). For the crustal end-member a composition similar to that of young TIB crust is used (Figure 5.7); this corresponds in age to the 'normal deep crust' component advocated by Andersen et al. (2001, 2002b, 2009b). The  $\epsilon$ Hf of this crustal end-member is similar to a metagreywacke unit from the Idefjorden terrane (Figure 5.7), indicating that material with an appropriate age, Hf signature and sedimentary nature, does exist within the region. A  $\delta^{18}$ O value of 14 is used for the crustal component, and is based on an estimated average value for sedimentary rocks (Simon & Lécuyer 2005). The mantle end-member uses  $\epsilon$ Hf and  $\delta^{18}$ O values appropriate for depleted mantle at 1500 Ma.



Figure 5.8.  $\epsilon$ Hf<sub>(1500 Ma)</sub> versus  $\delta^{18}$ O VSMOW<sub>(zircon)</sub> for zircons of this study. Bulk-mixing curves and mantle and crustal end-members are discussed in the text. Symbols as in figure 5.5.

The use of either AFC or bulk-mixing modelling will result in similar mixing curves, but with different proportions of end-members (Kemp et al. 2007). In this study a simple two-component mixing model was employed, since Hf or O do not correlate with indices of differentiation (e.g.

SiO<sub>2</sub>; figures 5.5 and 5.6), as would be expected with an AFC process. Since the oxygen content is assumed to be similar in mantle and crustal rocks, the shape of the mixing curves depends on the Hf concentration of the end-members. The two curves shown (Figure 5.8) use depleted mantle (0.199ppm; Salters & Stracke, 2004) or lower crustal (1.9ppm; Rudnick & Gao 2003) values for the mantle end-member, combined with an upper crustal value (5.3ppm; Rudnick & Gao 2003) for the crustal end-member. Using depleted mantle combined with upper crustal values is compatible with a source contamination model; whereas using lower crust combined with upper crust values is compatible with a crustal contamination model. The data fall between the two curves, suggesting (assuming that the end-members are appropriate) that mixing is not limited to contamination in the mantle region, but has involved crustal input higher in the magmatic plumbing system. Alternative values could be chosen iteratively to fit the data; however, for any curve that falls through the data and uses the same end-member values, the mixing proportions will be similar. The Hf-O mixing curves indicate that 10-50% of the crustal component is required.

#### 5.5.5 Processes of continental recycling

Addition of a crustal component to mantle-derived magmas can be achieved by a number of processes. As discussed previously, the  $\delta^{18}O$  signature is too high to be compatible with contamination in the mantle via subducted high- $\delta^{18}O$  material. This is based on the assumption however, that the mantle is homogeneous in  $\delta^{18}O$ . Although this is normally the case (e.g. Valley et al. 1998), there are some examples where enrichment via mantle processes has lead to an increase in  $\delta^{18}O$  recorded in magma suites. In mantle domains enriched by subducted sediment (i.e. EM2),  $\delta^{18}O$  in olivine is increased from 5.2 to 5.7 (Workman et al. 2008); this is modeled as 2-3% sediment input. In the Banda arc,  $\delta^{18}O_{zircon}$  values are ~5.5 to 6.5 ‰ (Vroon et al. 2001), with the increase from the mantle value being related to 1-5% subducted sediment input. In settings where the subducted slab itself is postulated to have had an input to arc magmatism,  $\delta^{18}O_{melt}$  values reach ~8 ‰ (Setouchi belt, Japan; Bindeman et al. 2005). In all of these examples, the enrichment in  $\delta^{18}O$  is much smaller than that recorded in the Telemarkian rocks (up to  $\delta^{18}O_{zircon} \sim 10$  ‰), suggesting processes additional to mantle recycling are required.

In Kamchatka, arc basalts across the region have high- $\bar{\delta}^{18}$ O (up to 8.5‰  $\bar{\delta}^{18}$ O<sub>melt).</sub> The occurrence of these high- $\bar{\delta}^{18}$ O basalts is accounted for by one or more of three processes: 1) crustal contamination of mantle-like magmas with high- $\bar{\delta}^{18}$ O (~10‰) sediments in the lower or middle crust, 2) addition of high- $\bar{\delta}^{18}$ O (~10-20‰) slab fluids into the magma generation zone, or 3) parental basalts were derived by melting of thickened lower crust that already had high- $\bar{\delta}^{18}$ O (~6.5-7.2‰) (Bindeman et al. 2004). These processes can also be applied to this study; slab-fluid addition would require excessive amounts of fluids (Bindeman et al. 2004), and the  $\epsilon$ Hf of this component is likely to not have been evolved enough, since the subducting ocean crust will have been relatively young. Further to this, Hf has variably conservative behaviour; some studies have shown that it can be

mobilized in slab fluids (Woodhead et al. 2001; Barry et al. 2006), whereas others recorded immobile behavior (Pearce et al. 1999). Crustal assimilation is not advocated in the Kamtchatkan example because of energy conservation considerations (Bindeman et al. 2004). However, high amounts of assimilant are advocated in the Lachlan orogen (Kemp et al. 2007). In the Telemarkian rocks up to 50% assimilant is required using the proposed end-members, and is achievable according to the model of Kemp et al. (2007). Melting of an older high- $\delta^{18}$ O source is advocated for the Kamchatkan arc basalts, with this source being volcanic material such as high- $\delta^{18}$ O hydrated metabasalt (Bindeman et al. 2004); the high- $\delta^{18}$ O values are derived from deep-seated enrichment by slab fluids, or by low-temperature alteration followed by burial by tectonic and magmatic processes. For the Telemarkian magmatism, both crustal assimilation and melting of older high- $\delta^{18}$ O crust are concluded to be possible processes.

Discriminating between the different processes requires examining evidence outside of the zircon data. For the Telemarkian rocks, a variety of evidence points to input of the crustal component occurring within the parent magma source zone: 1) the lack of zircon inheritance is suggestive of introduction in the lower crust where magmatic temperatures are higher, and where zircon-free material is more likely to reside; 2) the geochemistry of the suite points to extensive fractional crystallisation of mafic parent magmas without crustal assimilation during differentiation; 3) data on zircon core-rim pairs are lacking, but repeat analyses on the same grains, whether on the same growth zone, or on different growth zones, are generally within analytical uncertainty of each other, suggesting that the crustal component was not introduced during the later stages of zircon crystallization; 4) a granitic sample with the most mantle-like values suggests that a degree of closed-system differentiation was able to occur; 5) Hf and O do not correlate with indices of differentiation (SiO<sub>2</sub>; Figures 5.5 and 5.6), as would be expected with an AFC process; 6) no definitively older metasedimentary rocks are found outcropping within the region, either as outcrop or as enclaves within the magmatic rocks. All of the evidence above is compatible with a setting in which the crustal component is mixed with depleted mantle or young mantle-derived material, in a lower crustal melting region, similar to the deep hot crustal zone setting (Annen et al. 2006), advocated in the Lachlan orogen (Kemp et al. 2007), or the Melting Assimilation Storage and Homogenisation (MASH) zone, advocated in the Andean arc (Hildreth & Moorbath 1988).

Establishing how a high- $\delta^{18}$ O source resided in the lower crust prior to Telemarkian arc magmatism is speculative. Possible processes could include burial of volcano-sedimentary rocks during repeated opening and closing of back-arc and fore-arc basins during tectonic switching (i.e. repeated compression and extension; Collins 2002) in an accretionary orogen; such a process is responsible for granite formation and continental growth in the Lachlan orogen (Kemp et al. 2007; Kemp et al. 2009). Another process is underthrusting and underplating of subducted oceanic crust and overlying sediments to the lower crust during preceding subduction stages; such a process is advocated as a way of inputting high- $\delta^{18}$ O sources to the melt region of the Sierra Nevada batholith (Lackey et al. 2005). Tectonic burial of a crustal component would possibly lead to localised variation in radiogenic isotope signatures; based on previous isotopic constraints, the existence of an older crustal component at depth is widespread beneath SW Fennoscandia. Another process described previously is enrichment of mafic lower crust by slab fluids during previous periods of subduction (Bindeman et al. 2004); whether this can occur to the extent required in the Telemarkian example is yet to be constrained, as no such examples exist in the literature.

The Suldal arc is suggested to be built on attenuated continental crust (see Chapter 4), such crust may be relatively immature in composition (i.e. mafic), and comprise low-temperature altered material in its upper portions; thus, building a continental arc on such crust may involve mobilisation of older high- $\delta^{18}$ O material. Further evidence is required to establish how exactly a high- $\delta^{18}$ O source had an input to the Telemarkian arc magmatism. Repeated episodes of compression/extension in a retreating accretionary orogen is likely to result in burial of high- $\delta^{18}$ O material; stretching of such crust into attenuated margins and continental ribbons is likely to produce widespread domains with possible high- $\delta^{18}$ O signatures. Thus, retreating accretionary orogens provide a setting where assimilation of older sedimentary material may be prone to occur. Irrespective of the exact mechanism for producing a high- $\delta^{18}$ O source, it is the mixing of this source in the melt generation zone that can be gleaned from the available data. By mixing in the source region, any characteristic geochemical signature that the high- $\delta^{18}$ O source may have is homogenized with a mantle-derived subduction-zone signature (i.e. in a MASH zone). Bulk-mixing in this MASH zone is heterogeneous, such that daughter magmas can exhibit variably enriched Hf and O isotope signatures (Figure 5.5 and 5.6). The high- $\delta^{18}$ O source could have included zirconbearing felsic material, but in this case the melt generation zone must have been hot and zirconundersaturated such that zircon was dissolved; more likely is that the high- $\delta^{18}$ O source was dominantly mafic, and comprised hydrated metabasalt as advocated for Kamchatkan arc magmas (Bindeman et al. 2004).

## 5.6 Conclusions

The Hf-O data in this study indicate that Telemarkian magmatism involved significant recycling of previously formed continental crust, with bulk-mixing calculations indicating 10-50% involvement of a component that has an average model age of ~2.15 Ga. This continental material was recycled within the crust (intracrustal recycling), comprised sedimentary material, and was mixed with mantle-derived material in the lower crust in a MASH zone (Hildreth and Moorbath 1988). The data do not exclude the existence of the 'normal deep crust' component of Andersen et al. (2001; 2004a, 2009b). It is suggested that the existence of older crust residing at depth in the Telemarkia terrane, is due to the fact Telemarkian arc magmatism was built upon crust that comprised Gothian-age

(>1600 Ma) sedimentary material. The continental building of Telemarkian and Gothian age crust occurred in a retreating accretionary orogen, which likely featured tectonic burial of sedimentary material, addition of mantle-derived melts to arc magmatism, and mobilization of older crustal material in melt generation zones. A modern analogue for this is the southwestern Pacific, which comprises oceanic and continental arcs at varying levels of maturity, which feature varying amounts of older ensiliac crust, but generally all include continental growth via juvenile mantle addition.

# Geochemical and Hf-O constraints on the petrogenesis of earlyto late-Sveconorwegian magmatism in S. Norway

Aim – In light of the new U-Pb ages for Sveconorwegian magmatism (see Chapter 3), the petrogenesis and tectonic setting of the different magmatic suites in southern Norway is discussed, basing observations on new in-situ Hf and oxygen isotope data combined with whole-rock geochemistry.

## 6.1 Introduction

During the Sveconorwegian orogeny, southern Norway was intruded by voluminous suites of granite *sensu lato*; these include suites of both I- and A-type affinity, with the latter including an Anorthosite-Mangerite-Charnockite (AMC) body. The abundance of large anorthosite massifs such as these is a unique feature of the middle Proterozoic. The origin of A-type granites, including Rapakivi-type suites which are commonly associated with AMC suites, is an ongoing matter of debate within igneous petrology (e.g. Martin 2006); understanding the petrogenesis of these magma series can inform us about processes of crustal formation and differentiation. Several processes are favoured for the genesis of A-type granites, including melting of granulitic refractory crust (Collins 1982; Clemens 1986; Whalen et al. 1987), melting of tonalitic crust (Anderson 1983; Creaser 1991; Patiño Douce 1997), and derivation from mafic crust (Frost & Frost 1997; Anderson et al. 2003). Recent studies using the accessory mineral zircon have constrained mixed mantle and crustal sources for both I and A-type granites (e.g. Peck et al. 2004; Kemp et al. 2006; Appleby et al. 2009; Be'eri Shlevin et al. 2009).

In southern Norway, four main suites of magmatism occurred around the period of the Sveconorwegian orogeny (1050-920 Ma). These are the Feda suite (I-type) at ~1050 Ma (Bingen et al. 1993; Bingen & van Breemen 1998), the Fennefoss suite at ~1035 Ma (Bingen & van Breemen 1998), the A-type Hornblende-Biotite-Granite (HBG) suite at 970-930 Ma (Andersen et al. 2002a, 2007a; Vander Auwera et al. 2003), and the Rogaland AMC suite at ~930 Ma (Schärer et al. 1996). Peak crustal thickening related to continent-continent collision occurred at ~1035 Ma (Bingen et al. 2008c), such that the Feda and Fennefoss suite are considered to be early- to syn-collisional suites, and the HBG and AMC suites are considered to be post-collisional. This study (see Chapter 3) has shown that undeformed granites normally grouped under the HBG suite are as old as 1047 Ma, and therefore pre-collisional in age, and also that deformed porphyritic granitoids (e.g. Feda suite) can be extended in their age range back to 1069 Ma. The emplacement of the HBG suite, although considered to be post-collisional, is controlled by orogenic structures (Duchesne et al. 1999; Bolle et al. 2003b); the suite intruded during phases of crustal doming that is related to the gravitational collapse of the Sveconorwegian orogen (Andréasson and Rodhe 1994; Romer 1996; Bingen et al.
2006). As a consequence of their different geodynamic setting, the petrogenesis of different suites is typically discussed separately.



Figure 6.1. A) Sketchmap of Fennoscandia showing the main geological provinces. B) Sketchmap of SW Fennoscandia showing the division of lithotectonic domains (after Bingen et al. 2005b). C) Map of southern Norway showing the location of Sveconorwegian granitoid suites (modified from Bingen et al. 2005b; Vander Auwera et al. 2008; Slagstad et al. 2008). Ha = Hardangervidda Sector, Su = Suldal Sector, RVA = Rogaland Vest-Agder Sector, TIB = Transcandinavian Igneous Belt, MUSZ = Mandal-Ustaoset Shear Zone, KPSZ = Kristiansand-Porsgrunn Shear Zone, SSSZ = Saggrenda Sokna Shear Zone, VSZ = Vardefjell Shear Zone, ØBZ = Østfold Marstrand Boundary Zone, SFDZ = Sveconorwegian Frontal Deformation Zone, PZ = Protogine Zone. Grid co-ordinates are UTM zone 32V.

# 6.2 Previous studies

The HBG suite is defined as a ferro-potassic A-type suite (Vander Auwera et al. 2003), and is ferroan, metaluminous to weakly peraluminous, and features enriched incompatible elements as well as enriched large ion lithophile elements (LILE). Vander Auwera et al. (2003) showed that the HBG suite defines a differentiation trend from 50 to 77% SiO<sub>2</sub>; this trend is interpreted to represent extreme fractional crystallisation from basaltic parent magmas. Such parental basaltic parent magmas are postulated to be partial melts of a hydrous mafic and potassic source lying in the

lithospheric upper mantle, or the mafic lower crust derived from it (Vander Auwera et al. 2003). Differentiation via fractional crystallisation without assimilation is corroborated by data from the Lyngdal-Tranevag Suite (Bogaerts et al. 2003). Analysing natural and experimental data, and using trace element modeling, Vander Auwera et al. (2008) showed that both 73% fractional crystallization of an amphibole-bearing gabbroic cumulate subtracted from the parent mafic composition, and 30% non-modal batch melting of an amphibolitic source equivalent in composition to the mafic facies, produce a monzodioritic liquid that is appropriate to be a parent magma to the HBG suite.

Bogaerts et al. (2006) conducted crystallisation experiments on members of the Lyngdal Suite; comparison with natural data suggest crystallisation of a monzodioritic parent at 2-5 Kbar, with 5-6 wt% water and oxygen fugacity of NNO to NNO+1. An oxygen fugacity above NNO is also indicated by the assemblage magnetite+quartz+titanite (Vander Auwera et al. 2003). The high crystallisation temperature and water content of the Lyngdal Suite are suggested to be too high for primary magmas produced by partial melting of the crust (Bogaerts et al. 2006), with fractionation from mafic magmas being more likely. Using geothermobarometers (hornblende-plagioclase and Al-in-hornblende), crystallisation pressures are estimated at 1.3 to 2.7 Kbar for members of the HBG suite (Vander Auwera et al. 2003). Given the 5-6 wt% H<sub>2</sub>O content for the Lyngdal granodiorite (Bogaerts et al. 2006), the monzodioritic parent is calculated to have been 4.05 to 4.85 wt% H<sub>2</sub>O, and the amphibolitic source for this parent to have been 1.51 to 1.74 wt% H<sub>2</sub>O (Vander Auwera et al. 2008).

Andersen et al. (2001) group post-collisional granitoids in Telemarkia into three groups based on isotopic and trace element compositions; Group 1 (normal-Sr) granites have >150 ppm Sr,  ${}^{87}$ Rb/ ${}^{86}$ SR <5, Sri<sub>930Ma</sub> <0.710 and  $\epsilon$ Nd <0; Group 2 (low-Sr) have <150 ppm Sr,  ${}^{87}$ Rb/ ${}^{86}$ SR >5, Sri<sub>930Ma</sub> >0.710 and  $\epsilon$ Nd <0; Group 3 comprises one granite from the south of the Telemark Sector that has Sri<sub>930Ma</sub> <0.710 and  $\epsilon$ Nd >0. Most of the HBG suite falls into Group 1, whereas plutons in the north of the Telemark Sector fall into Group 2.

The gneissic country rocks exposed in Rogaland have too high a <sup>87</sup>Sr/<sup>86</sup>Sr ratio to be involved in the petrogenesis of Group 1 HBG granitoids (Bogaerts et al. 2003; Vander Auwera et al. 2003). The restricted Sr range also suggests (but is not restricted to) contamination by a Rb-depleted (i.e. granulitic lower crust) source (Vander Auwera et al. 2003). The absence of a correlation between SiO<sub>2</sub> and Sr<sub>i</sub> or  $\epsilon$ Nd suggests assimilation is not controlling the isotope signatures of the HBG suite (Bogaerts et al. 2003).

Andersen et al. (2001) postulate various crustal end-members found within southern Norway; 'CA' is moderately LILE-enriched deep crust with a  $T_{DM}$  of 1.9 Ga and has a composition similar to

'upper continental crust'; 'CB' also has a  $T_{DM}$  of 1.9 Ga, is more LILE-enriched and is equivalent to metasedimentary gneisses in the Bamble terrane; 'CC' has a  $T_{DM}$  of 1.7 Ga with highly radiogenic <sup>87</sup>Sr/<sup>86</sup>Sr. Bolle et al. (2003a) postulate two different crustal end-members for Sr-Nd mixing calculations, 'C1' has a  $T_{DM}$  of 1.8 Ga and is LILE-enriched, and 'C2' has a  $T_{DM}$  of 1.9 Ga and is moderately LILE-enriched. Mixing between a depleted mantle component and CA/C2 (moderately LILE-enriched, normal-Sr, 1.7-1.9 Ga in age) crustal end-member can produce the isotope signature of Group 1 granites in Telemark and Rogaland with 30-70% of the crustal end-member. Binary mixing between these two end-members requires 20-40% crustal contamination to produce the composition of the monzodioritic parent liquid to the HBG Suite (Vander Auwera et al. 2008). This amount of contamination is suggested to be unrealistic, but can be lowered to 10-20% by using higher Sr and Nd contents (Vander Auwera et al. 2008). Group 2 granites require the CC (highly radiogenic <sup>87</sup>Sr/<sup>86</sup>Sr) end-member to be involved. Whereas the isotope compositions of Nd and Sr in the crustal and mantle end-members can be related to non-element selective bulk-mixing processes, the lead-isotope systematics require element selective processes such as fluid-exchange (Andersen et al. 2001).

Andersen et al. (2002b, 2007b, 2009b) and Andersen & Griffin (2004) present in-situ hafnium zircon data for various Sveconorwegian granitoids from across southern Norway. The Hf data corroborate with whole-rock Nd data, in terms of the relative amounts of mantle and older crust required in bulk-mixing calculations. Scarce inherited zircon signatures (see Figure 6.12) are inferred by these authors to confirm the presence of older Palaeoproterozoic crust at depth. However, as discussed by Liégeois and Stern (2010), inherited zircons do not confirm the existence of older crust; they only confirm that older zircons were available for assimilation. The most radiogenic (but non-outlying and non-inherited) Hf isotope composition of the Sveconorwegian granites requires involvement from a source with EHf<sub>950Ma</sub> -4, which approximates to a model age of 1950 Ma (2-stage using Lu/Hf 0.015; Andersen et al. 2002b). Hf data on gneisses in central Telemark and younger granitoids suggest depleted mantle input to magmatism at ~1.2 Ga (Andersen et al. 2007b), that later formed a source involved in the Sveconorwegian magmatism (Andersen et al. 2009b). The range in  $\varepsilon$ Hf for individual plutons reaches >8 epsilon units; this is suggested by Andersen et al. (2009b) to be incompatible with closed-system differentiation of a homogeneous parental magma, however, closed-system differentiation from a heterogeneous source is not considered by the authors.

Andersen et al. (2002b) stated that mid-Proterozoic (i.e. 1.5-1.6 Ga) calc-alkaline protoliths are unlikely to have been a source for the Sveconorwegian granitoids in Telemarkia, because no such rocks exist in the region. However, this has recently been shown to not be the case, in fact widespread exposed crust in Telemarkia is constructed of calc-alkaline Telemarkian (1.52-1.48 Ga) gneiss (Bingen et al. 2005b, see Chapters 2-5).

The Rogaland AMC suite involved fractional crystallisation of a mafic anhydrous parent magma under low oxygen fugacity (Vander Auwera & Longhi 1994; Vander Auwera et al. 1998; Longhi et al. 1999), with anorthosite bodies forming by diapiric rise of plagioclase accumulations (Emslie 1985; Longhi et al. 1993). Fractional crystallization of the parent magmas involved crustal contamination, with different magma batches undergoing varying degrees of contamination (Bolle et al. 2003a); the crustal contaminant is represented by moderately to strongly-LILE enriched gneisses 1.5-1.9 Ga in age. Re-Os isotope data from the AMC suite suggest formation by melting of a mafic lower crust that is 1400-1550 Ma in age (Schiellerup et al. 2000).

The Feda suite is high-K, calc-alkaline, metaluminous, and displays characteristics typical of continental arc granites (Bingen & van Breemen 1998). It has been modelled via bulk-mixing of ultra-potassic-mantle and crustal components (Bingen et al. 1993). Andersen et al. (2001) showed that 20-35% crustal contamination using CA/C2 and depleted mantle end-members can produce the required isotopic compositions. Although the fields for Feda granitoids and Group 1 granites overlap in Nd and Sr space, lead isotope data indicate that the Group 1 granites cannot be formed purely by remelting of Feda granitoids (Andersen et al. 2001).



Figure 6.2. Geological map with sample localities of this study. (see Figure 6.1 for references)

The Fennefoss suite comprises similar augen gneisses to that of the Feda suite, but with a geochemical signature transitional between A-type and subduction-zone related; this signature is interpreted to represent the last vestiges of a subduction regime (Bingen & van Breemen 1998).

# 6.3 Analytical Methods

Whole-rock geochemistry was conducted using methods outlined in Chapter 4; hafnium and oxygen isotope analyses were conducted using methods outlined in Chapter 5.

# 6.4 Petrography and geochemistry

#### 6.4.1 The HBG suite

Samples of the HBG suite in this present study come from the Storlivatnet intrusive complex in the Suldal Sector and from the Sjelset and Søredalen intrusive complexes in the RVA Sector (Figure 6.2). The Storlivatnet complex contains various units, both deformed and undeformed, with ages at  $1021 \pm 8$  Ma,  $1039 \pm 15$  and  $1069 \pm 9$  Ma (see Chapter 3). The dominant lithology is a coarsegrained porphyritic granite comprising K-feldspar, altered plagioclase, quartz and biotite; hornblende is present in some units, and titanite is often intergrown with biotite. The Søredalen intrusive complex contains medium to coarse grained undeformed and deformed granitic units, with ages at  $991 \pm 35$  and  $1003 \pm 43$  Ma. The granites are composed of K-feldspar, plagioclase and quartz, with minor biotite and muscovite, and variable amounts of garnet; up to 20% garnet occurs where the granites contain inclusions and schlieren of pelite. The Sjelset intrusive complex complex complex on a ~990 Ma units; the latter is sampled in this study. The sampled granite is dated at  $993 \pm 16$  Ma, and comprises K-feldpar, quartz, altered plagioclase, biotite and muscovite.

The geochemistry of the HBG granites is compared with other members of this suite in figures 6.3 to 6.6. The HBG granites are metaluminous to weakly peraluminous, ferroan (except one sample), and calc-alkalic to alkali-calcic (Figure 6.3). In their major and trace element contents the samples of this study mostly overlap those of previous studies (Figures 6.4 & 6.5); SiO<sub>2</sub> content ranges from 68.7 to 76.4 %. The HBG suite forms bell-shaped trends in some elements (e.g. Ba, Nb and Zr), positive trends in others (e.g. Rb), and negative trends in others (e.g. Sr, V); inflections in these trends occur at ~60-65% SiO<sub>2</sub>. On the primitive-mantle normalised plot (Figure 6.7), the HBG suite exhibits relative depletions in Ba, Nb, Sr, P, Eu and Ti. These can be related to fractionation of feldspar (Ba, Sr and Eu), apatite (P) and titanite/Fe-Ti oxides (Ti). The depletion in Nb is typical of subduction-related magmas, suggesting the HBG granites formed by remelting or fractionation of subduction-related parent magma. The HBG granites exhibit enrichment in LILE and HSFE, and positive LILE/HFSE and LREE/HREE ratios.

#### 6.4.2 The Feda suite

The Feda suite refers to ~1050 to ~1020 Ma megacrystic (alkali-feldspar) granitoids that form the Sirdal Zone; the Sirdal zone is defined as the zone separating the Suldal sector to the northeast from the Rogaland sector to the southwest (Slagstad et al. 2008). The Sirdal zone comprises large



Figure 6.3. Geochemical classification diagrams for granitoid suites in southern Norway. Data for Lategranite, leucogranite and Feda granitoid from this study; HBG Suite from Auwera et al. (2003); Feda Suite and Fennefoss Suite from Bingen et al. (1993). ASI (aluminium saturation index), FeOt(FeOt+MgO) (i.e. Fe\*) and Na2O+K2O-CaO (i.e. MALI) from Frost et al. (2001).

volumes of megacrystic granitoid gneiss, leucocratic granite-pegmatite, and smaller volumes of medium-grained biotite-granite. The term 'Feda' Suite originally referred to ~1050 Ma augen gneisses outcropping to the south of the RVA Sector (Bingen et al. 1993; Bingen & van Breemen 1998), and is retained here for all porphyritic granitoids of this age that outcrop in the Sirdal Zone. The Feda granitoids are undeformed to moderately deformed, but folded by large, open folds with wavelengths of up to several kilometres (Slagstad & Marker 2009, pers. comm.). Samples within this study are dated at  $1019 \pm 10$ ,  $1027 \pm 24$ ,  $1043 \pm 6$ , and  $1046 \pm 3$  Ma (Slagstad & Marker 2009, unpublished data). The granitoids are granodioritic to granitic, and typically exhibit large (1-2cm) K-feldspar phenocrysts, sometimes red in colour. The matrix is composed of altered plagioclase, quartz and K-feldspar, with biotite in all samples, and hornblende, titanite and epidote being minor minerals in some units.

Previous geochemical data from the Feda suite (Bingen et al. 1993) is shown for comparison with the new data in figures 6.3 to 6.6. The Feda suite ranges from quartz monzodiorite and granodiorite to granite, is metaluminous to weakly peraluminous, and alkali-calcic (Figure 6.3). On the Fe\* classification (FeO<sup>t</sup>/(FeO<sup>t</sup>+MgO; Frost et al. 2001) the previous Feda data exhibit a magnesian





trend; data from this study fall into two groups, one that overlaps the previous magnesian trend, and one that overlaps the ferroan HBG suite. In major and trace element contents the Feda suite exhibits trends that are similar to the previous Feda data; however some of the new data is different in that they overlap the HBG trends. The trends between the Feda and HBG suites are typically subparallel, but with varying contents of some elements. For example, in major element contents the Feda suite has lower TiO<sub>2</sub> and FeOt, and greater MgO and Al<sub>2</sub>O<sub>3</sub>; in trace element contents the Feda suite has lower Nb and Zr, greater Sr, and similar Ba and Rb (Figures 6.4 and 6.5). The Feda suite exhibits relative depletions in Nb, P, Eu and Ti (Figure 6.7); the depletions in P, Eu, and Ti are all to a lesser extent than in the HBG suite. The LILE are similarly enriched to that of the HBG suite, but the HFSE are less enriched. The LREE enrichment relative to HREE enrichment is also greater in the Feda Suite (La/Y; Figure 6.6).



Figure 6.5. Harker diagrams for selected trace elements. Symbols as in figure 6.3 except for the HBG suite which is plotted at black diamonds.



Figure 6.6. SiO<sub>2</sub> versus Al/Ga, Total REE contents, La/Yb and Eu\*/Eu. Eu\* = Eu/( $\sqrt{\text{Sm}*\sqrt{\text{Gd.}}}$ ) Symbols as in figure 6.4 except for the Feda Suite which is plotted as small grey-filled circles.

#### 6.4.3 Leucogranites

Leucocratic granite and pegmatite are found within the Sirdal zone, and are characterised by gradual transitions, on a several-meter scale, between coarse-grained granite and pegmatite. Inclusions of fine-grained migmatitic paragneiss are found abundantly in parts of the leucocratic granite-pegmatite. Samples are dated at  $1021 \pm 61$ ,  $1025 \pm 25$ , and  $1045 \pm 13$  Ma (Slagstad & Marker 2009, unpublished data). The sampled leucogranites are typically medium-grained biotite granite, comprising K-feldspar, quartz, altered plagioclase and biotite. Some areas are rich in inclusions of amphibolite or gneiss; within these, opaque minerals, titanite and zircon are more abundant, sometime forming schlieren.

The leucogranites straddle the boundary between metaluminous and peraluminous, are variably ferroan/magnesian and calc-alkalic to alkali-calcic (Figure 6.3). In major and trace element contents the leucogranites roughly overlap the evolved members of the HBG suite (Figures 6.4 to 6.6). In the primitive mantle normalised plot (Figure 6.7) the leucogranites exhibit depletions in Ba, Nb, Sr, P, Eu and Ti; the depletions are similar in extent to those of the HBG suite. The LILE/HFSE and LREE/HREE enrichment in the leucogranites is similar to that of the Feda Suite (Figures 6.6 to 6.7).



Figure 6.7. Primitive mantle (Sun & McDonough 1989) normalised plots comparing the HBG, Feda and Leucogranite suites.

### 6.4.4 Zircon saturation temperature

Figure 6.8 shows zirconium content plotted against M ((Na+K+2Ca)/Al\*Si)) for the samples in this study, along with zircon saturation isotherms from Watson & Harrison (1983). The magnesian members of the Feda suite fall close to the 800°C isotherm, whereas the ferroan members extend to higher temperatures similar to those of the HBG suite. The leucogranites have relatively low temperatures (<810°C).



Figure 6.8. M ((Na+K+2Ca)/(Al\*Si)) versus Zr ppm for granite suites of this study, isotherms are zircon saturation temperature (calculated from Watson & Harrison 1983).

# 6.5 Results - Hf isotopes

Hf isotopes were measured in 12 granitoids from across the study area (Figure 6.9). Two of these samples (MM2230 and MM26297) are from the leucogranite belt within the Sirdal Zone (Figure 6.2), and include inherited zircons that are ~1500 Ma in age; the  $\epsilon$ Hf of these inherited zircons is between +7.51 and 12.74). Disregarding the inherited zircons, the total range in  $\epsilon$ Hf across all samples (6.5 epsilon units) is fairly narrow considering the number of samples. The mean of each sample varies from  $\epsilon$ Hf -0.78 to +2.57. Within each sample the range in  $\epsilon$ Hf is limited, with the MSWD being between 0.03 and 2.3 for 10 out of 11 samples. The sample with a higher MSWD (MM26302) features two analyses that have higher  $\epsilon$ Hf that are out of the range of the entire suite. This is the only sample with a convincing degree of geological heterogeneity; analytical uncertainty can explain the heterogeneity within the other samples. Two stage model ages (T<sub>DMC</sub>) range from 1474 Ma to 1887 Ma.



Figure 6.9. Results of in-situ Hf analyses;  $\epsilon$ Hf<sub>(initial)</sub> is plotted against arbitary units. For each sample the weighted mean and 2s.e. are shown as a black solid line and block dotted lines respectively. From MM26297, only ~1500 Ma inherited zircons were analysed for Hf; U-Pb analyses reveal a ~1045 Ma population of magmatic zircons.

# 6.6 Results - Oxygen isotopes

Oxygen isotope data was determined on a subset of six samples (Figure 6.10). The total range in  $\delta^{18}$ O is from +4.66 to +12.09‰. Five of the samples have means (+5.74 to +7.07‰) that are slightly above the mantle value (5.3 ± 0.3‰), and one sample (MM26306) has values that are much higher (mean = +11.63 ‰). The range in each sample is variable; in three samples (MM26306, ROG641 and SA3-01) the range is within analytical uncertainty (MSWD = 0.69 to 1.7), and in the other three samples (MM2247, MM26032 and ROG80) the range likely represents geological heterogeneity (MSWD = 3.2 to 8.1).



Figure 6.10. Results of in-situ oxygen analyses;  $\delta^{18}$ O VSMOW <sub>(zircon)</sub> plotted against arbitary units. For each sample the weighted mean and 2s.e. are shown as a black solid line and block dotted lines respectively. Mantle zircon =  $\delta^{18}$ O 5.3 ± 0.3 ‰ (Valley et al. 1998).

# 6.7 Discussion

#### 6.7.1 Hf-O constraints on magma source

Figure 6.11 shows  $\epsilon$ Hf versus time for the granitoids of this study along with published data from the region. The  $\epsilon$ Hf of the Feda suite is remarkably similar to that of the HBG Suite; there is no temporal change in  $\epsilon$ Hf either, with granitoids across the Sveconorwegian period all having similar values. The range in  $\epsilon$ Hf for an individual sample in this study was typically smaller than that measured in previous studies (Andersen et al. 2002a, 2007b, 2009b); whether this is due to real geological variation or an analytical effect is difficult to constrain, since previous studies include a greater number of analyses per sample.

The Sveconorwegian granitoids intrude 1.5-1.6 Ga crust that is calc-alkaline and rather juvenile in nature (Chapter 5; Andersen et al. 2002a), the evolution of this crust is shown in Figure 6.11; also shown is the evolution of ~1.7-1.9 Ga Transcandinavian Igneous Belt (TIB) crust. The Sveconorwegian granitoids largely overlap with the 1.5-1.6 Ga crust, suggesting that remelting of 1.5-1.6 Ga crust to produce the younger granitoids is compatible with the Hf isotope data. Outliers in the previously published data that have low  $\varepsilon$ Hf (see Figure 6.11) have been used as evidence for an older >1.7 Ga component to be involved in the petrogenesis of the late-Sveconorwegian granitoids (Andersen et al. 2002b; 2007b; 2009b). These potentially inherited zircons are small in number, they lack U-Pb data in some cases, and in others the U-Pb data is not discussed in terms of discordance/metamorphic disturbance; the evidence for a >1.7 Ga component based on these zircons is therefore unpersuasive.

The mantle is a remarkably homogeneous oxygen isotope reservoir, with igneous zircons formed in equilibrium with the mantle having an average  $\delta^{18}$ O of 5.3 ± 0.3‰ (Valley et al. 1998). High

magmatic  $\delta^{18}$ O values (>6.5‰) are attributed to melting or assimilation of sediments, altered volcanics, or other supracrustal rocks affected by low-temperature alteration, whereas low magmatic  $\delta^{18}$ O values are attributed to incorporation of material that has undergone high temperature alteration (Valley et al. 2005). Oxygen isotopes can therefore be used to discriminate mantle recycling from intracrustal recycling.



Figure 6.11.  $\epsilon$ Hf<sub>(initial)</sub> versus intrusion age (Ma) for Sveconorwegian granitoids. The field for 1.5-1.6 Ga granitoids is based on data from Andersen et al. (2002b) and Chapter 5. The field for TIB (1.7-1.9 Ga) crust is based on data from Andersen et al. (2009a). The evolution of these fields uses an average crustal Lu/Hf value of 0.015. Depleted mantle (DM) is based on Griffin et al. (2000), and CHUR uses values of Bouvier et al. (2008). Error bars represent 2s.d. of the mean.

Oxygen isotopes are similar for both Feda suite granitoids (MM2247, MM26302, and ROG80) and HBG granitoids (ROG641, SA3-01). The average values are above the mantle range, suggesting a magmatic source with a high- $\delta^{18}$ O, such as weathered continental crust. The origin of the highest- $\delta^{18}$ O granitoid (MM26306) is discussed in section 6.7.5. In summary, the Hf-O isotope data suggest a similar source is likely for both ferroan and magnesian magmas, and for early- syn- and late-orogenic suites.

#### 6.7.2 Formation of silicic melts - magma mixing versus fractional crystallization

An origin for the HBG suite via fractional crystallisation has been advocated in various studies (Vander Auwera et al. 2003, 2008; Bogaerts et al. 2003, 2006). Andersen et al. (2009b) disagree with this model, instead, they suggest a model whereby silicic end-members have been formed by

crustal anatexis, and these have mixed with differentiated and contaminated mantle-derived mafic end-members. The bell-shaped trends observed in some trace element harker diagrams are pivotal to this debate (see Figure 6.12). Vander Auwera et al. (2003) suggest the bell-shape is due to a change in fractionating phases such that certain trace elements behave incompatibly during early fractional crystallisation, turning to compatible behavior during fractionation of more evolved magmas. A lack of magma-mixing between mafic and silicic end-members means that samples do not fall within the bell-shape. Andersen et al. (2009b) propose that mafic magmas have differentiated producing positive trends at low silica content, silicic melts are formed by partial melting of crustal rocks, and that the negative trend after ~55% SiO<sub>2</sub> is due to mixing between these silicic melts and the differentiated mafic melts. In this case, mixing should occur between silicic melts and mafic compositions at varying degrees of differentiation, such that a variety of mixing lines are produced (see Figure 6.12c); the lack of such mixing lines in the data is suggested by Andersen et al. (2009b) to reflect a lack of local homogenization. Andersen et al. (2009b) also point out that the HBG trend discussed by Vander Auwera et al. (2003, 2008) is made up of unimodal or bimodal clusters, and that individual plutons do not exhibit single differentiation trends (see Figure 6.12a).



Figure 6.12. A) SiO2 verus Zr for plutons within southwest Norway. Aseral, Handeland, Svofjell, Lyngdal, Holum, Rustfjellet, Red granite and Bessefjellet are members of HBG suite shown in figures 6.3 to 6.6 (from Vander Auwera et al. 2008 & Bogaerts et al. 2003); Storlivatnet and Søredalen are members of HBG suite from this study; other data points represent other individual plutons in the region (from Andersen et al. 2009b). B) evolution of the HBG trend via fractional crystallisation of a mafic parent magma (see text) C) evolution of the HBG trend via mixing between mafic parent magmas, and silicic melts derived from crustal anatexis. (see text for explanation of these models).

In response to these arguments it is worth pointing out that typical models for formation of granite plutons, involve segregation of felsic melts, collection of these melts into larger bodies, and buoyant uprise of these bodies via varying dyking/stoping mechanisms (e.g. Marsh 1992; Brown 1994; Petford et al. 2000). Therefore, mafic and intermediate compositions are often going to be located at

deeper crustal levels than that of the felsic plutons. The density contrast between mafic/intermediate and felsic melts means that even if all melts are mobilized, the felsic magmas will rise highest in the crust. Arguments against differentiation of felsic plutons from mafic magmas have often cited the argument of a lack of exposed mafic to intermediate crust (e.g. Haapala et al. 2005), however, these are hindered by the fact that exposure at the surface is typically constrained to a certain crustal level (normally upper-crustal). As pointed out by Vander Auwera et al. (2008), if the HBG suite was formed by fractionation of a lower crustal mafic parent magma, then the mafic residues are likely to still reside in the lower crust, or to have been returned to the mantle.

The trends in figure 6.12 are compatible with differentiation of a parent magma with ~57% SiO2 and ~800 ppm Zr, to more evolved composition with lower Zr. This parent magma is indicated by Bogaerts et al. (2003, 2006) to be a monozodioritic composition. Using experimental and natural data, Vander Auwera et al. (2008) show that this monzodiorite composition can be produced by both fractional crystallisation and partial melting of an amphibolitic source magma. The new data presented here overlap the previous HBG data, and do not help resolve the issue over which petrogenetic process is responsible. However, the petrogenetic model proposed later in this chapter advocates differentiation from mafic parent magmas, either by fractional crystallisation, partial melting or more likely by both processes; in so doing this the model does not contradict the experimental data or modelling of natural data, but also aims to account for the isotopic constraints that Andersen et al. (2001, 2002b, 2007b, 2009b) outline in their petrogenetic models.

#### 6.7.3 Geochemical constraints on magma source

For Sveconorwegian magmatism, Bingen et al. (1993) advocate a change in Fe\* over time, with early granitoids (Feda suite) having low Fe\*, late granitoids (HBG suite) being highest in Fe\*, and the Fennefoss suite falling in the middle. The data presented here shows that although the granitoids <1000 Ma are all ferroan (high Fe\*), early granitoids are both magnesian (low Fe\*) and ferroan; therefore the geochemistry is changing spatially and not just temporally. The ferroan samples have higher TiO<sub>2</sub>, FeO<sup>1</sup>, and incompatible elements (e.g. Nb, Zr, REE), lower MgO, Al<sub>2</sub>O<sub>3</sub> and Al/Ga, and greater depletion in Ba, Sr, P and Eu (Figures 6.4 to 6.7). These characteristics are all typical features of A-type granites (e.g. Whalen 1987; Collins 1982), and can be explained by a greater degree of plagioclase fractionation (which lowers Ba, Sr, Eu in residual melts), lesser degree of partial melting or melting of an enriched source (to account for the increase in incompatible elements). A-type granites form at higher temperatures than I-type granites (Collins 1982; Clemens et al. 1986). The difference between zircon saturation temperatures of the magnesian and ferroan granitoids (see Figure 6.8) is compatible with the ferroan members of the Feda suite being more closely related to A-type magma series.

Changes between the amount of plagioclase fractionation versus the amount of Fe-Ti oxide fractionation can be related to intensive parameters during melt generation. An increase in water content promotes the stability of plagioclase and reduces the stability of Fe-Ti oxides (Gaetani et al. 1993; Sisson & Grove 1993), an increase in oxygen fugacity has the same effect although to a lesser extent (Toplis & Carroll 1995; Feig et al. 2006; Hamada & Fuji 2008), and an increase in pressure has the reverse effect (Grove et al. 2003). Water content also has the effect of lowering the solidus, meaning that the degree of melting will be increased in hydrous conditions (Baker et al. 1994), as is consistent with the incompatible element contents. The importance of plagioclase fractionation for producing A-type magmas means they typically have anhydrous sources advocated. It could thus be inferred that the source conditions for the magnesian granites were hydrous and more oxidising, and for the ferroan granites were anhydrous and reducing. This is contradicted however by experiments on the parent to the Lyngdal granodiorite, suggesting crystallization at 2 to 4 Kbar from a magma with 5 to 6 % H<sub>2</sub>O at an fO<sub>2</sub> of NNO to NNO+1 (Bogaerts et al. 2006). Such oxidizing and hydrous conditions have been recognised in other A-type granites, and form a subset classified as oxidized A-type granites (Dall'Agnol et al. 1999; Dall'Agnol & Oliveira 2006); such granites typically contain >4 wt% H<sub>2</sub>O and can be derived from lower crustal igneous quartzo-feldspathic sources (Dall'Agnol & Oliveira 2006).

Trends for the Feda and HBG suites do not appear to converge at low silica contents, although this conclusion is hampered by the lack of mafic (<57% SiO<sub>2</sub>) compositions in the Feda suite. At  $\sim57\%$  SiO<sub>2</sub> the two trends are markedly different in major and trace element contents, therefore, the monzodiorite parent magma that evolved to form the HBG suite (Vander Auwera et al. 2008), is not suitable for forming the Feda suite. Thus, formation of these two suites may have involved either a different source magma, or different conditions during fractionation/melting of this source to produce different parent magmas.

The Hf-O isotope data, and previous Nd and Sr data (Bingen et al. 1993; Andersen et al. 2001), point to a similar source in terms of isotope signatures for both the Feda and HBG suites. The similarity in geochemical enrichment (see Figure 6.7), except for elements related to plagioclase/Fe-Ti oxide fractionation, is also striking. The negative Nb anomaly in both suites is suggestive of a source with a subduction-zone influence, as opposed to asthenospheric mantle which typically lacks a Nb anomaly (e.g. Thompson 1983; Fitton et al. 1997). Both whole-rock and isotope geochemistry point to a similar source for the HBG and Feda suites; thus, the influence of crystallisation conditions is advocated for the changes in geochemistry.

In the model of Vander Auwera et al. (2008), the monzodiorite parent magmas to the HBG suite contain 4.05-4.85 wt%  $H_2O$ , likely formed by partially melting of amphibolite with 1.5-1.7 wt%

 $H_2O$ , which originated by fractionation or partial melting of a lower crustal source with 0.34-0.85 wt%  $H_2O$ . The Feda suite source magmas likely contained a greater water content than this, so that Fe-Ti oxide relative to plagioclase stability was increased, therefore hindering iron enrichment and producing more magnesian compositions; and also producing greater degrees of partial melting. The greater water content in the Feda suite is compatible with their postulated supra-subduction zone origin (Bingen et al. 1993; Bingen & van Breemen 1998; Slagstad et al. 2008). Over time the Sveconorwegian magma suites become entirely ferroan, this temporal change can be related to a decrease in the water content of the magma sources over time. A temporal decrease in water content can be related to dehydration via successive melting and heating from magmatic underplating (Landenberger & Collins 1996). Since continent-continent collision occurred by 1035 Ma (Bingen et al. 2008c), any flux of water related to a postulated subduction zone will have been cut off by ~1035 Ma.

As noted previously, as well as the HBG suite being ferroan, some members of the Feda suite are also ferroan (including MM26306 - 1046±3 and ROG218 – 1027±24 Ma). Thus, an explanation of the ferroan and magnesian trends must allow for their contemporaneous formation (at least at a >1 Myr timescale). To account for this, a suggested model (Figure 6.13) involves: 1) melting of mafic lower crust to form parent magmas that evolve to magnesian Feda granitoids, 2) dehydration zones occurring above the melt generation zones, and 3) melting of the dehydrated lower crust for form parent magmas that evolve to ferroan Feda granitoids. This model is base on that proposed for the Triassic I and A-type granites of the Chaelundi Complex, Australia (Landenberger & Collins 1996). Generation and ascent of early formed magnesian magmas leaves the crust relatively anhydrous but not refractory (chemically depleted); this crust will stay anhydrous unless new hydrous mantle-derived arc magmas are intruded. Remelting of this refractory crust is only achievable at high temperatures (>900°C; Landenberger & Collins 1996); this can occur during prolonged periods of magma underplating, but may require thinning of the crust and heat from asthenospheric mantle (Zhao et al. 2008).

Two possibilities exist for the origin of the heterogeneity in water content in the Sveconorwegian lower crust, 1) that the lower crust was already low in water content prior to the Sveconorwegian orogeny, and that increased water content occurred when there was sufficient volatile flux from subduction, or 2) that the crust didn't have low water content prior to the Sveconorwegian orogeny, and that dehydration zones that sourced ferroan magmas were formed by continued heating and extraction of melts. Given that there is evidence for magmatic underplating and A-type magmatism prior to the Sveconorwegian orogeny, i.e. 1.2 Ga juvenile magmatism in Telemark (Andersen et al. 2007b), and 1.16 Ga charnockite intrusions in Rogaland Vest-Agder (Zhou et al. 1995), it is postulated that the crust was already low in water content prior to the Sveconorwegian orogeny.



Figure 6.13. Petrogenetic model for the formation of the Feda, HBG and AMC suites; see text for explanation. Modified from Vander Auwera et al. (2008).

### 6.7.4 Leucogranite formation

The leucogranites (MM2230 and MM26207) have Hf isotopic signatures similar to the HBG and Feda suite (Figure 6.10). The geochemistry of the samples is rather scattered, but in general the data fall on trends that overalp with the Feda suite (Figures 6.3 to 6.6). In the primitive mantle normalised diagram (Figure 6.7) the leucogranites have similar LILE and HFSE enrichments to that of the Feda suite; depletions in Ba, Sr, P, Eu and Ti fall between those of the Feda and HBG suite.

The leucogranite samples have higher silica content than the Feda suite, and are found spatially with Feda granitoids. For these reasons, it is hypothesised that the majority of the leucogranites represent highly differentiated members of the Feda suite.

#### 6.7.5 Continental recycling during Sveconorwegian magmatism

The Hf and oxygen isotopes point to a similar source for both magnesian and ferroan granitoids, and also for early-, syn- and late-Sveconorwegian suites. This source included a component that is substantially greater in age than the granitoids; average model ages fall in the region of 1700 to 1900 Ma. The  $\delta^{18}$ O data suggest that this older component comprised a high- $\delta^{18}$ O source, such as weathered sediments, thus, the magnatism involved recycling of continental material via intracrustal processes.

The Hf-O data can be produced by remelting of 1.5-1.6 Ga crust that has a high- $\delta^{18}$ O signature, however, previously determined whole-rock isotope and geochemical studies have shown that both a mantle and crustal component was involved in the petrogeneses of the early- and late-Sveconorwegian granitoids (Bingen et al. 1993; Vander Auwera et al. 2003; Bogaerts et al. 2003; Andersen et al. 2001). For example, Nd and Sr measured on late-Sveconorwegian granitoids in Rogaland, points to bulk mixing between 45-70% depleted mantle, and 30-55% of a crust component (the 'normal deep crust'; Andersen et al. 2001). To compare the new Hf-O data with previously published models, bulk-mixing calculations are discussed.

Figure 6.14 shows  $\epsilon$ Hf versus  $\delta^{18}$ O that is measured on the same zircons. Shown on this diagram is the range in Hf-O that ~1.5-1.6 Ga crust would have at 950 Ma (based on data presented in Chapter 5). C1 is a crustal component correlative in age with the 1.7-1.9 Ga deep crustal component of Andersen et al. (2001; 2007b; 2009b), and has a high- $\delta^{18}$ O of +12 compatible with a sedimentary origin. C2 is a crustal component that is equivalent in age to C1, but has a mafic  $\delta^{18}$ O signature; this component is therefore compatible with ancient underplated material. C3 is a crustal component that is young relative to the magmatism (i.e. <1200 Ma), and has high- $\delta^{18}$ O of +11; this component is compatible with an origin as young weathered sediments that have been derived from the Fennoscandian continent.

Since the oxygen content is assumed to be similar in mantle and crustal rocks, the shape of the mixing curves depends on the Hf concentration of the end-members. The curves shown use either depleted mantle (0.199ppm; Salters & Stracke 2004) or lower crustal (1.9ppm; Rudnick & Gao 2003) values for the mantle end-member, combined with an upper crustal value (5.3ppm; Rudnick & Gao 2003) for the crustal end-member. Using depleted mantle combined with upper crustal values is compatible with a source contamination model; whereas using lower crust combined with upper crust values is compatible with a crustal contamination model. The majority of the granitoids

in this study can be modelled with bulk-mixing between older crustal components that are variable in oxygen values (C1 and C2), with a depleted mantle contribution of 50-70%.



Figure 6.14.  $\epsilon$ Hf<sub>(950 Ma)</sub> versus  $\delta^{18}$ O VSMOW<sub>(zircon)</sub> that are measured in the same zircon domains. The grey dashed box represents average 1.5-1.6 Ga crust at 950 Ma, based on HF-O data in Chapter 5. Values for crust and mantle end-members are discussed in the text. Curves are derived from bulk-mixing calculations, with dashes marking 20% increments. The filled grey bar represents values for young altered ocean crust and overlying sediments. The grey unfilled boxes represent the total range in  $\epsilon$ Hf and  $\delta^{18}$ O for each sample. (Symbols as in Figure 6.9).

An anomalously high- $\delta^{18}$ O granitoid (MM26306) does not fit an array between the depleted mantle and C1/C2 components, and instead suggests mixing with alternative end-members. It may simply be a case that the crust is highly heterogeneous in oxygen, and that the small sample population of this study has fortuitously fallen into two clusters. However, an alternative process is suggested that accounts for the array displayed by the high- $\delta^{18}$ O granite. This process involves mixing between young high- $\delta^{18}$ O sediments (C3) and older high- $\delta^{18}$ O crust (C1). The mixing proportions for this granite require 40-70% of the older crustal component. The introduction of the C3 component to a lower crustal melt generation zone may have occurred via underthrusting during subduction that preceded the continent-continent collision. Such a scenario is advocated for the Grenvillian Frontenac terrane in Laurentia (Peck et al. 2004). However, in this example a whole terrane exhibited a much higher oxygen value than the adjacent terranes. In the example discussed here, it is a single granite that has a much higher  $\delta^{18}$ O value than surrounding granites. Thus, this model is rather speculative and requires further data to be tested. It is worth noting that the geochemistry of the high- $\delta^{18}$ O granitoid is indistinguishable from granitoids with lower  $\delta^{18}$ O; thus highlighting how in-situ zircon data can recognise magma source changes that whole-rock data cannot distinguish. Mixing calculations in this study are compatible with the Nd-Sr mixing calculations of Andersen et al. (2001), which suggest 30-55% of a crustal component for the HBG suite and 20-35% for the Feda suite; with the crustal component having a  $T_{DM}(Nd)$  of 1.9 Ga. The mixing calculations of previous studies, and those described above, do not include the presence of ~1.5 Ga crust. Since crust of such age dominates the exposed upper- crust in the region, it likely did have a contribution to Sveconorwegian magmatism. Evidence for this is provided by  $\sim 1.5$  Ga inherited zircons in various granites (Table 10.4; Bingen et al. 2005b; Andersen et al. 2009b). Andersen et al. (2009b) advocate three crustal sources for Sveconorwegian granitoids: 1.7 Ga granitoids similar to young members of the TIB, 1.5 Ga felsic igneous rocks, and 1.2 Ga juvenile granitoids; these crustal sources are indicated to have mixed with juvenile mantle-derived material. This hypothesis is compatible with the Hf-O data presented in this study, however, it is expected that the C1 and DM end-members probably contributed much less material than that indicated by two-component mixing, and that the Telemarkian crust had a much larger contribution. In summary, the Hf-O data suggest supracrustal material (weathered sediments) contributed to the magma source of the Sveconorwegian granitoids. The magma source is equivalent to both 1.5 Ga crust, and to a mixture of older crust (~1.7 Ga) and mantle. In-situ Hf data from previous studies have recorded zircon inheritance that suggests input of older (~>1.7 Ga) and younger (~1.2 Ga) components.

#### 6.7.6 Reconciling the Hf-O and geochemical constraints

The following two notions can be reconciled into one model that accounts for all of the data: 1) The whole-rock geochemistry of the granitoids suggests derivation from mafic lower crust, which likely occurred via partial melting and fractionation of mafic lower crustal melts to form mafic/intermediate parent magmas, and fractionation of these parent magmas to form the various granitoids (Vander Auwera et al. 2003, 2008; Bogaerts et al. 2003; 2006). 2) The Hf and O (along with previous Hf, Nd and Sr) isotope data indicate contribution from crust that is ~1.5 Ga, ~1.7-1.9 Ga, and ~1.1-1.2 Ga in age, combined with younger mantle-derived material (Andersen et al. 2001, 2002a, 2007b, 2009b; Bingen et al. 1993; Bogaerts et al. 2003).

The origin of a high- $\delta^{18}$ O signature in the older crustal components is largely related to burial of late Palaeoproterozoic supracrustal material and its remobilisation during ~1.5 Ga Telemarkian magmatism (see Chapter 5); continental crust formation via arc magmatism at ~1.5 Ga would have left a residual mafic lower crust that retained a high- $\delta^{18}$ O signature, and a geochemical signature typical of subduction-related magmatism. Underplating may have occurred at 1.2 Ga (Andersen et al. 2007b), adding mafic crust with mantle-like isotopic signatures to the lower crust. During the Sveconorwegian period, the mafic lower crust, in particular its base, will have acted as a zone of mixing, assimilation, storage and homogenisation (i.e. MASH zone; Hildreth & Moorbath 1988). Melting in this MASH zone region produced parent magmas to the Sveconorwegian magmatic suites. The rather homogeneous isotope and geochemical signatures thus result from derivation from a homogenised mafic lower crustal source. Differences in granite geochemistry result from varying water content (along with smaller effects of oxygen fugacity and pressure). Formation of the Rogaland AMC suite from the same mafic lower crustal source region is compatible with this model; Re-Os data suggest derivation from 1.4-1.55 Ga mafic lower crust (Schiellerup et al. 2000), and Nd-Sr suggest >1.5 Ga crustal components and <1.2 Ga mantle components (Menuge 1988; Bolle et al. 2003a).

#### 6.7.7 Geodynamic setting

The protracted period of magmatism (~1070-920 Ma) requires a significant heat source; this in turn can be related to the tectonic setting and geodynamic regime of the crust in question. The Feda Suite has an ambiguous origin, either relating to crustal thickening during the Sveconorwegian orogeny, or to the late stage of an active continental margin that existed prior to continent-continent collision (e.g. Bingen et al. 2008c). Early Sveconorwegian granites dated at 1039-1069 Ma are emplaced in a region that suffered little effects of the Sveconorwegian orogeny (Slagstad et al. 2008; Chapter 3), and metamorphism related to crustal thickening is not recorded until 1035 Ma (Bingen et al. 2008b), thus, a subduction-setting is favoured for the early-Sveconorwegian granitoids. This setting will also provide a volatile flux for producing the hydrous magmas (magnesian members of the Feda suite). During the peak continent-continent collision phase, the crust is inferred to be overthickened (Bingen et al. 2008b); this may have provided further heat for lower crustal melting. Between 980 and 940 Ma the geodynamic regime in the region changed from compressional to extensional (Bingen et al. 2008b), voluminous granitoid emplacement in this period suggests a continued heat flux to the lower crust. The late-Sveconorwegian granites <970 Ma, have been explained by rise of asthenosphere after delamination of underthrust lithosphere (Vander Auwera et al. 2003; Duchesne et al. 1999); this model is partly explained by the linear alignment of the HBG Suite in relation to the Mandal-Ustaoset Shear Zone. Thus, the origin of heat flux to the lower crust has varied over the Sveconorwegian period; however, there are no distinct pauses or changes in magmatism that can identify a change in geodynamic regime.

#### 6.7.8 Continental growth during Sveconorwegian magmatism

Determining the extent of juvenile mantle addition to the magmatic suites has its inherent problems; the low Lu/Hf of both zircons and crustal rocks means that even in a hundred million years, the measured <sup>176</sup>Hf/<sup>177</sup>Hf ratio will not change significantly enough to be discernable. For example, in this study the mantle component in bulk-mixing modelling is calculated using depleted mantle at 950 Ma, however, the youngest mantle contribution could be mafic underplate that is as old as 1.2 Ga (Andersen et al. 2007b). Thus, the data point to contribution from mantle that is 1.2 Ga or younger, but also indicate a significant proportion of recycled crust that is ~1.5 Ga and older. Overall, the Sveconorwegian period has seen a significant degree of remobilisation of older crust,

and a limited volume of crustal growth (mantle addition). This crustal remobilisation (or intracrustal recycling), where felsic plutons form in the upper crust and mafic residues are produced in the lower crust, is an important process that aids the stratification and differentiation of the continental crust.

# 6.8 Conclusions

Voluminous granitic magmatism occurred in southwest Norway from ~1070 to 920 Ma. All granitoids display features associated with subduction-related magmatism, i.e. alkali-calcic to calcalkaline, metaluminous to weakly peraluminous, and depletion in Nb, Ti, and P. The early- to syn-Sveconorwegian granitoids feature both magnesian (I-type) and ferroan (A-type) magma series. The late-Sveconorwegian granitoids are more iron-enriched and have a greater A-type signature. The Fennefoss suite (not sampled; Bingen & van Breemen 1998) has geochemistry transitional but more towards the ferroan suites. The change between ferroan and magnesian magma series can be explained by changes in crystallising conditions (namely the water content) as opposed to changes in magma source.

Magmatism prevailed during differing geodynamic regimes, from supra-subduction, to collisional, and then to extensional. Throughout these different regimes the heat source will have varied; however, both the magma source and the process of granite production likely stayed the same. The Hf-O data suggest the magma source involved a large contribution from crust ~1.5 Ga and older, as well as a contribution from mantle-derived material that is 1.2 Ga or younger. This magma source was mafic lower crust that had homogeneous isotopic and geochemical characteristics imparted from previous magmatic episodes, and that was partially melted and fractionated to form parent magmas to the individual granitoid suites.

This study highlights: 1) how weathered continental crust may contribute to the source of I and Atype granitoids, 2) how such granitoids can form in a variety of tectonic settings as long as there is significant heat flux, and 3) how the conditions in the melt generation zone impart the strongest control on the geochemistry and petrography of granitoid suites.

# The 1.24 Ga Grossæ-Totak suite, a new age confirms an old correlation in the Telemark supracrustals, southern Norway

**Aim** – This chapter presents the first U-Pb age from the Grossæ-Totak belt in the Telemark Sector. Correlations between this and other supracrustal belts within SW Fennoscandia are discussed, as is the tectonic setting of 'interorogenic' units within the region.

# 7.1 Introduction

From ~1800 to 1500 Ma, Fennoscandia is considered to have grown along its southwestern margin via oceanward migration of a long-lived subduction zone (Åhäll & Connelly 2008), i.e. a retreating accretionary orogen (Cawood et al. 2009). The Telemarkia block is suggested to represent a continuation of this south-westerly growth, thereby extending continental growth via arc magmatism to at least ~1460 Ma (see Chapters 4, 6 and 9; Slagstad et al. 2008). Following the 1.8-1.46 Ga growth of SW Fennoscandia, the crustal domains were subject to repeated episodes of magmatism. These have previously been referred to as interorogenic events (Åhäll & Connelly 1998; Bingen et al. 2003); however, it is now increasingly recognised that these magmatic events likely occurred in response to convergent-margin processes on the SW margin of Fennoscandia (Brewer et al. 2004; Söderlund et al. 2005; Söderlund & Ask 2006).

Within the Telemarkia terrane, the Suldal and Hardangervidda Sectors are home to the Sæsvatn-Valldall rift basin that formed at ~1.26 to 1.21 Ga (Bingen et al. 2002; Brewer et al. 2004). In the Telemark Sector, rift basins formed earlier at ~1.5 Ga (Vestfjordallen Supergroup, Laajoki et al. 2002; Dahlgren 1990), and later at ~1.16 Ga (Sveconorwegian Supergroup, Laajoki et al. 2002, Bingen et al. 2003). In the Setesdal region of southern Telemark, supracrustal deposition and calcalkaline plutonism occurred between 1320 and 1200 Ma (Pedersen et al. 2009); the exact tectonic setting during this period is undefined, but the geochemistry points to a supra-subduction zone setting. The extensional basins that formed in the Telemarkia terrane are typically not correlated across the Mandal-Ustoaset Shear Zone which separates the Suldal and Rogaland Sectors from the Telemark Sector (Figure 7.1). In the original mapping of this region (Sigmond 1975, 1978), the Grossæ-Totak supracrustal belt in Telemark was speculatively correlated with the Sæsvatn-Valldall supracrustal belt is not included in published map figures and is not defined in the tectonostratigraphy e.g.Corfu & Laajoki 2008), but is assumed to correlate with the younger 1.17-1.14 Ga Sveconorwegian Supergroup (Bingen, pers. comm. 2010).

# 7.2 Geological Setting

The Telemarkia block comprises four sectors; the Telemark Sector in the east, and the Rogaland, Suldal and Hardangervidda Sectors in the west. In Hardangervidda the oldest outcropping rocks may be as old as 1.65 Ga (Ragnhildsvet et al. 1994). However, gneisses with >1.5 Ga zircon ages have since been interpreted as paragneiss units (Bingen et al. 2005b). In all of the sectors the basement comprises volcanic-plutonic gneisses and granitoids that are 1.55-1.46 in age and likely formed in a continental arc setting (Bingen et al. 2005b; Chapter 4). The Sæsvatn-Valldall supracrustal belt formed within the Suldal Sector at 1.26-1.21 Ga (Bingen et al., 2002; Brewer et al., 2004). At 1.22-1.16 Ga, orthopyroxene-bearing granitoids intruded the Rogaland Sector (Slagstad et al. 2008; Zhou et al. 1995). Abundant metasediments within the Rogaland Sector, including those with passive-margin facies, are suggested to have formed within an extensional basin that formed as Rogaland rifted away from Suldal (Slagstad et al. 2008). The Sirdal Zone (Slagstad et al. 2008) that divides the Rogaland and Suldal Sectors comprises ~1.05 Ga porphyritic granitoids that formed as a result of convergent-margin magmatism possibly related to the subduction of Rogaland under the Suldal Sector (Slagstad et al. 2008), although they may also reflect crustal melting after thickening during the early stage of the Sveconorwegian orogeny (Bingen et al. 2008c). Late-Sveconorwegian granites (0.98-0.93 Ga; Andersen et al. 2002a, 2007a) and a 0.93 Ga Anorthosite-Mangerite-Charnockite complex (Schärer et al. 1996) intruded the Rogaland and Suldal Sectors after the main collisional phase of the Sveconorwegian orogeny.

The Telemark Sector features a >10km thick succession of supracrustals comprising the 1.5->1.35 Ga Vestfjorddalen, and 1.16-1.10 Ga Sveconorwegian Supergroups (Laajoki et al. 2002). The Vestfjordallen Supergroup comprises the bimodal 1.51 Ga Rjukan Group and the overlying sedimentary Vindeggan Group..Bimodal magmatism is related to continental extension that occurred inboard of a subduction zone in a setting similar to the Granite-Rhyolite provinces in the mid-continental US (Slagstad et al. 2009). The Vemork Formation that is part of the Rjukan Group is dominated by metabasalt units; an intercalated metavolcanite is dated at  $1495 \pm 2$  Ma (Laajoki & Corfu 2007). The 5km thick Vindeggan grous comprised mostly of quartz-rich strata; a crosscutting diabase intrusion dated at 1347 ± 4 Ma (Corfu & Laajoki 2008) places a minimum age constraint on sedimentary deposition within the group. The Sveconorwegian Supergroup comprises bimodal volcanic and sedimentary sequences deposited between 1.17 and 1.12 Ga (Laajoki et al. 2002; Bingen et al. 2003), that formed in extensional basins inboard of a continental arc (Brewer et al. 2004), or in a Basin and Range setting (Bingen et al. 2003). Intrusions in the Telemark Sector include 1.22-1.2 Ga juvenile granitoids (Andersen et al. 2007b), 1.19-1.13 Ga A-type plutons (Bingen et al. 2003), and a 1.03 Ga suite transitional between calc-alkaline and A-type (Bingen & van Breemen 1998). The Setesdal valley in the southwest of the Telemark Sector is host to the





Figure 7.1. Map of SW Fennoscandia highlighting post-1.5 Ga and pre-Sveconorwegian units. RVA = Rogaland Vest-Agder, MUSZ = Mandal-Ustaoset Shear Zone.



Figure 7.2. Map of the southern part of the Telemark supracrustals, showing the location of the dated Fjellhovdane metarhyolite (F11). Modified after Bingen et al. (2003) and Corfu & Laajoki (2008).

# 7.3 Sample description and results

The sample that has been dated is a metarhyolite from the Fjellhovdane unit towards the base of the Totak sequence (Figure 7.3), and formed part of the study of the Telemark supracrustals undertaken by Brewer (1985). The sample comprises fine-grained quartz and feldspar, with epidote, Fe-Ti oxides and rare muscovite; coarser quartz grains have developed into stringers. Zircon occurs as an accessory phase.



Figure 7.3. Stratigraphy of supracrustal belts within Telemarkia, based on Sigmond (1978), Bingen et al. (2002), Brewer et al. (2004) and Corfu & Laajoki (2008).

U-Pb geochronology used the LA-ICP-MS method outlined in Chapter 3; the zircons were not chemically abraded. 18 analyses provide a weighted mean  $^{207}$ Pb/ $^{206}$ Pb age of 1238 ± 10 Ma (MSWD = 3.6), using an external error of 34 Ma. This age is interpreted to reflect the crystallisation of the rhyolite.



Figure 7.4. U-Pb concordia showing results of LA-ICP-MS dating of the Fjellhovdane rhyolite.

# 7.4 Discussion

In regional maps, the Grossæ-Totak supracrustal belt is grouped under the Sveconorwegian Supergroup, and is thus assumed to have a 1.17-1.14 Ga depositional age. The 1236 Ma age of the Fjellhovdane rhyolite shows that the Grossæ-Totak belt is older than the Sveconorwegian Supergroup, and is in fact much closer in age to the Sæsavtn-Valldal Belt in the Suldal Sector (1.26-1.21 Ga; Bingen et al. 2002; Brewer et al. 2004). As well as a similar age, the Grossæ-Totak and Sæsvatn-Valldal belts have similar characteristics that suggest they formed by similar tectonic and magmatic processes, namely, early rhyolitic volcanism followed by voluminous basaltic volcanism, with intercalated quartz-rich sediments (Brewer et al. 2004). The geochemistry and whole-rock Nd and Hf isotope systematics of the Sæsvatn-Valldal Belt are interpreted to represent rhyolite formation by crustal anatexis, early basaltic volcanism involving significant crustal contamination, and later basaltic volcanism tapping a mantle source and undergoing less crustal contamination (Brewer et al. 2004). The initial crustal anatexis is produced by basalt intrusion into the crust as a consequence of lithospheric thinning (Brewer et al. 2004). The geochemistry of the Grossæ-Totak rhyolites is similar to the Trossovdal rhyolites of the Sæsvatn-Valldall belt (Figure 7.5), suggesting that similar crustal rocks underwent melting to form the rhyolites. Both suites feature highly enriched LILE, enriched HFSE, elevated LILE/HFSE ratios, and relative depletion in Nb, Sr, P and Ti. These features are suggestive of a continental arc setting (Wilson 1989; Pearce 1982). In the Suldal Sector, Telemarkian rocks likely formed in a continental arc setting (Chapter 4), and thus provide a potential candidate for crustal protoliths that underwent melting to form the rhyolites in the Sæsvatn-Valldall belt. In the Telemark sector, similar age lithologies are not recorded at the surface, which is largely due to the more widespread younger sedimentary cover in this region. Assuming the Fjellhovdane rhyolite formed by the same tectonothermal process as for the formation of the Trossovdal rhyolite, the geochemistry suggests that continental arc rocks are located at depth within the Telemark Sector, lending support to the hypothesis that the Telemark block grew by continental arc magmatism in the Telemarkian period (Bingen et al. 2005b).



Figure 7.5. Primitive Mantle normalised (Sun & McDonough, 1989) plot for felsic units within the Sæsvatn-Valldall belt (Trossovdal), Grossæ-Totak belt (Fjellhovdane) and metaplutonic/volcanic basement within the Suldal Sector (Sauda). Trossovdal data from Brewer et al. (2004); Suldal data from Chapter 4.

Gneisses of the Vravatn Complex in Telemark are slightly younger than the Grossæ-Totak belt, with ages of ~1220-1200 Ma, and have Hf isotope signatures that suggest formation with a significant depleted mantle input (Andersen et al. 2007b). This juvenile magmatism is interpreted to reflect an episode of mafic underplating in the region (Andersen et al. 2007b). In the Setesdal region, south of the Grossæ-Totak belt, supracrustals were deposited between 1320 and 1200 Ma (Pedersen et al. 2009). Hf isotopes from this region suggest that a change in magmatism from a dominantly older crustal input to a juvenile input occurred between 1220 and 1215 Ma (Pedersen et al. 2009). This provides further supporting evidence for mafic underplating of the crust. The deposition of volcanic and sedimentary rocks with associated juvenile mafic intrusions, spanning the period from 1320 to 1200 Ma, is probably linked to the same long-lived tectonic process. This involved mafic underplating and intrusion, crustal anatexis, and continental sedimentation in rift basins. As suggested by Brewer et al. (2004), the lithospheric extension that allowed for these processes was likely linked to extension of the overriding plate in a subduction setting, i.e. the extensional basins are back-arc expressions of a long-lived convergent margin. Continental arc rocks of equivalent age are not recorded in the region, although the Tromøy Block located off the

southeast coast of Telemarkia does have a postulated island-arc origin (Knudsen & Andersen 1999), attesting to convergent margin processes in the region. If a continental arc located to the west of Telemarkia did exist at 1300-1200 Ma, then this crust must have been recycled by subduction erosion, or translated to a different continental region during the Sveconorwegian orogeny.

In the eastern parts of the Southwest Sveconorwegian Domain (SSD) the magmatic record for the 1300-1200 Ma time period is dominated by mafic magmatism in localised extensional settings. This includes the 1300 Ma Våstergotland dolerite suite in the Idefjorden terrane, the 1.27-1.26 Ga Central Scandinavian Dolerite Group across central Scandinavia, and the 1.22-1.2 Ga Protogine Zone dolerites in the Eastern Segment/Idefjorden terrane boundary zone (Söderlund et al. 2005). The latter features granite and syenite intrusions as well as mafic magmatism (Johansson 1990).

The 1300-1200 Ma events in Telemarkia are distinct from those in the eastern part of the SSD, i.e. in the west there was basin formation with deposition of sediments and associated bimodal volcanism, and in the east there was localised mafic magmatism with minor felsic magmatism. This contrast lead Corfu & Laajoki (2008) to suggest a more outboard and exotic origin for the Telemarkia terrane, as similar characteristics are recorded in the Composite Arc Belt of the Grenville province in Laurentia (Carr et al. 2000). However, the Dal Group in the Eastern Segment is an extensional basin that is interpreted to be a more distal equivalent of ~1.16 Ga supracrustals in the Sveconorwegian Supergroup (Bandak Group; Brewer et al. 2002). The Dal Group comprises quartzite, slate, mafic volcanics, and arkose that are interpreted as forming in a rift basin (Alm et al. 1997; Lundberg 1973), with deposition bracketed between 1.05 and 1.33 Ga (Romer & Smeds 1996; Piontek et al. 1998). Thus, although the timing of Dal Group deposition is not well constrained, it provides a link between the western and eastern parts of the SSD.

At ~1300-1200 Ma, the contrast between extensional basin formation in Telemarkia and formation of discrete mafic intrusions in Idefjorden and further east, may be a consequence of the difference in thermal properties of the crust. The younger Telemarkia block may have been a warmer, more mobile and thus weaker domain, whereas the older Idefjorden and Eastern Segment were probably colder, thicker and stronger crustal domains. This difference led to broad and widespread extension in Telemarkia and discrete more localized extension in the east.

# 7.5 Conclusions

A U-Pb age of  $1238 \pm 10$  Ma for the Fjellhovdane rhyolite indicates that the Grossæ-Totak supracrustal belt is older than the Sveconorwegian Supergroup (1.17-1.14 Ga), and overlaps in age with the Sæsavtn-Valldal supracrustal belt (1.26-1.21 Ga). This confirms a correlation made by Sigmond (1978) in the original mapping of the region. This age widens the temporal and spatial

extent of 1300-1200 Ma magmatism, and suggests that the tectonostratigraphy of the supracrustals in the Telemark Sector needs revision. The Grossæ-Totak belt is interpreted to be part of a widespread extensional phase affecting southern Norway, which occurred in response to a convergent margin that likely existed to the west of the current Norwegian coastline.

# In-situ U-Pb and Hf isotopes constrain the age & provenance of the Hardangervidda-Ryfylke Nappe Complex, SW Norwegian Caledonides

Aim - This chapter presents the first U-Pb and Lu-Hf data from Caledonian nappe units exposed in the Suldal Sector; the data are used to constrain the age and provenance of nappe units from a variety of structural levels. Correlations with nappe complexes elsewhere are discussed, as are insights into the Mesoproterozoic history of Fennoscandia.

# 8.1 Introduction

The Scandian phase of the Caledonian orogeny resulted in the continental margin of Fennoscandia being subducted underneath Laurentia, imbricated and thrust eastwards onto the foreland, with nappe displacements of up to several hundreds of kilometres (Roberts & Gee 1985). The Caledonian nappes have been traditionally divided into the Lower, Middle and Upper Allochthons. The Lower Allochthon comprises Precambrian basement and overlying cover sediments that can be correlated with autochthonous units; the Middle Allochthon comprises allochthonous Fennoscandian Precambrian basement and cover sediments from the continental margin and ocean-continent transition zone; the Upper Allochthon comprises lower Iapetus-derived oceanic units; and above this the Uppermost Allochthon comprises exotic units that are inferred to have a Laurentian ancestry (e.g. Gee 1975; Roberts & Gee 1985; Stephens & Gee 1985; Roberts 2003).

The Precambrian crystalline units found within the Caledonian nappes likely are parts of the Fennoscandian basement and record the Mesoproterozoic growth of Fennoscandia, including the continent's evolution during the amalgamation and break-up of the supercontinent Rodinia. Thus, the information recorded in the Caledonian nappe units is relevant to aid our understanding of palaeotectonics in the Precambrian of the Baltic Shield. Studies of the Scandinavian Caledonides have traditionally focussed on key areas (e.g. the Western Gneiss Region), leaving other regions less understood. The Hardangervidda-Ryfylke Nappe Complex (HRNC) in SW Norway is one such area, having received little attention since being mapped in the seventies (Naterstad et al. 1973; Andresen 1974; Sigmond 1975). The lack of U-Pb geochronology conducted on this nappe complex is especially hindering correlation with units elsewhere in Scandinavia.

# 8.2 Geological Setting

The allochthonous rocks south of the Hardangerfjord were grouped together as the Hardangervidda-Ryfylke Nappe Complex by Naterstad et al. (1973). In the Haukelisater-Røldal area, the HRNC can be subdivided into three allochthonous units (Andresen & Færseth 1982), these are (from the base



Figure 8.1. Geological map of the southern Norwegian Caledonides, and sample localities (indicated by arrows). After Gee et al. 2008; Sigmond 1975.

upwards) the Holmasjø allochthon, Nupsfonn allochthon, and the Dyrskard-Kvitenut-Revsegg allochthon. These units are separated by ductile shear zones that formed in amphibolite-facies (Andresen 1974). Southwest of Haukelisater-Røldal in the Sauda-Suldal area, two nappe units have been recognised, these are the Buadal and Storhei units (Sigmond 1978). The same units cannot be traced all the way from Hardangervidda southwest to the coast, this is due to both displacement along shearzones within the nappe complex, and the limited of extent of some units; however, similarities in the general structure of the complex do exist in all areas. Thus, the term Hardangervidda-Ryfylke Nappe Complex and its reference to the entire complex of nappes outcropping south of the Hardangerfjord are kept here. The following is a summary of published data on the nappe units of the HRNC that are sampled in this study; for further review the reader is referred to Sigmond (1978) and Andresen & Færseth (1982).



Figure 8.2. Tectonostratigraphy of the Hardangervidda-Ryfylke Nappe Complex, including new and published ages. Modified from Sigmond (1978) and Andresen & Færseth (1982).

# 8.2.1 Holmasjø unit (Lower Allochthon)

The Holmasjø unit comprises non-calcareous schists and phyllites commonly interspersed with thin quartzite layers and pods. The unit is metamorphosed in greenschist facies, with biotite and garnet formation recorded in some areas, although retrogression to chlorite is widespread (Naterstad et al. 1973). Polyphase deformation is evident in the unit. Low-angle thrust faults dip northwest and trend northeast-southwest; the transport direction along these is thought to be to the southeast and east, but with the dominant deformation phase being that of extension or back-thrusting to the northwest (Andresen & Færseth 1982). Locally, faults cut down into the basement so that basement slices can be found along the base of the unit (Andresen & Færseth 1982). Phyllites were dated in the Hardangervidda region by whole-rock Rb-Sr, giving an age of  $409 \pm 15$  Ma (Andresen et al. 1974).

The basal allochthon in the Suldal region, which has been correlated with the Holmasjø unit, contains a metaandesite that has been dated by whole-rock Rb-Sr at  $1145 \pm 98$  Ma (Sigmond & Andresen 1976). Holmasjø Unit phyllites in the study area are thought to represent a deeper water facies of the Cambrian to Lower Ordovician sediments of the Parautochthonous Vidda Group (Andresen 1978); in this case the Precambrian metaandesite may represent a thin thrust slice of crystalline basement caught up with younger cover sediments.

#### 8.2.2 Storhei unit (Middle Allochthon)

The Storhei unit is dominantly composed of layered gneisses, with subordinate augen gneiss, quartzite and amphibolite layers; the layered gneisses may have supracrustal origins (Sigmond 1978). Previous work suggests that the top of the unit comprises charnockitic gneisses, with acid to basic compositions and both foliated and massive varieties (Sigmond 1978). Diabase dykes with garnet and clinopyroxene intrude the charnockitic gneisses (Sigmond 1978). The layered gneisses are amphibolite-grade, with staurolite occurring west of Saudafjord (Sigmond 1978). The charnockitic rocks have reached granulite-facies, with the assemblage clinopyroxene-hypersthene-garnet-plagioclase-quartz recorded in massive gneisses; in the foliated rocks this is present as relics or has been replaced by amphibolite-facies assemblages (Sigmond 1978). No rocks within the Storhei or underlying Buadal nappe have been previously dated. The boundary between the Storhei and underlying units is a mylonitic thrust zone, but is gradational in terms of lithological change (Sigmond 1978).

#### 8.2.3 Dyrskard unit (Middle Allochthon)

The Dyrskard unit is composed of volcanic and sedimentary supracrustal rocks, dominated by metabasalts, metarhyolites and quartzites (Andresen & Gabrielsen 1979). From the base upwards the unit comprises 1) banded supracrustal gneisses, 2) quartzite, feldspathic sandstones and mica schists with minor basic to intermediate metavolcanics, 3) amphibolites with quartzite and marble horizons, and 4) acid metavolcanics (Gabrielsen 1980). Metabasalts have a restricted extent, whereas the metarhyolites are widespread (Gabrielsen 1980). Kyanite in a mica-schist, a plagioclase-amphibole-garnet assemblage in the amphibolites, and the lack of migmatisation, attest to medium-grade metamorphism under relatively high pressure (Sigmond 1978). Chlorite after biotite/amphibole records retrogression in greenschist-facies (Andresen 1974). Polyphase deformation is evident within the unit; the oldest phase occurred prior to thrusting of the overlying nappe units, and the youngest phase represents Caledonian folding (Sigmond 1978). Five samples from varying lithologies gave a whole-rock Rb-Sr isochron of 1289  $\pm$  80 Ma (Andresen et al. 1974). Another age determination was made at c. 1520 Ma (Gabrielsen & Solheim, in Gabrielsen & Solheim 1980), with the authors concluding that the 1289 Ma age was a mixed age and unreliable.

Thrust zone blastomylonites that occur between the Dyrskard and the overlying Kvitenut unit have also been dated by whole-rock Rb-Sr, giving an age of  $1504 \pm 41$  Ma (Gabrielsen et al. 1979).

#### 8.2.4 Kvitenut unit (Middle Allochthon)

The Kvitenut unit comprises quartzofeldspathic gneisses with subordinate calc-silicate rocks and migmatised gneisses. The lowermost part of the unit features mylonitic gneisses, whereas migmatite formation occurs in the upper part of the unit (Naterstad et al. 1973). Minor lithologies within the banded gneisses include marble, mica schist, diopside fels and plagioclase-diopside-epidote rocks (Andresen 1974). Gneissic intrusive bodies ranging from gabbro to granite that cut earlier fabrics are common, but do not cut the boundary into the underlying Dyrskard unit (Naterstad et al. 1973; Andresen & Færseth 1982). The migmatisation and development of schlieren in amphibolitic rocks, and the sillimanite/kyanite assemblages attest to medium- to high-grade metamorphism under medium to high pressure (Sigmond 1978). However, most of the unit has been retrogressed to amphibolite facies (Andresen 1974). The unit features multiple stages of deformation, most of which occurred in amphibolite-facies conditions and are interpreted as pre-Caledonian (Andresen & Færseth 1982). Some of the deformation occurred prior to thrusting of the unit above the underlying Dyrskard unit. An amphibolite gneiss has been dated by whole-rock Rb-Sr at 1643  $\pm$  88 Ma (Andresen et al. 1974), which was interpreted as a metamorphic age.

#### 8.2.5 Revsegg unit (Middle Allochthon)

The Revsegg unit is composed of muscovite-biotite gneisses with quartzo-feldspathic pods, concordant boudins of amphibolite and some cross-cutting intrusive bodies (Naterstad et al. 1973). The dominant rock type is a two-mica gneiss that has a variably developed schistosity. Interbedded with the mica gneiss is a hornblende-biotite gneiss that is commonly boudinaged. Large intrusive bodies are not found, but minor bodies of granodiorite and quartz-diorite apparently postdate the peak metamorphism and earliest structures (Andresen & Færseth 1982). The Revsegg unit is interpreted to have been deposited on the underlying Kvitenut unit (Naterstad et al. 1973), although this remains to be proven. The mineral assemblage biotite-muscovite-garnet-sillimanite/kyanite suggests medium-grade metamorphism under medium pressure (Sigmond 1978). The deformation recorded in the Revsegg unit is similar to that in the Kvitenut complex. Revsegg gneisses have been dated by whole-rock Rb-Sr and give ages of  $440 \pm 250$  Ma (Andresen et al. 1974) and  $1316 \pm 80$  Ma (Gabrielsen & Solheim 1980). The latter age was interpreted as a mixed age but constraining a minimum age for deposition, and the younger age indicates an influence from the Caledonian orogeny.


# 8.3 Rationale for isotope work

The scarcity of Rb-Sr age determinations and the questions over their reliability in mixed age populations, and the lack of any U-Pb dating, means a number of key issues relating to the HRNC

remain unresolved. For example: 1) does the tectonostratigraphy represent sequential emplacement of nappe units from more distal locations upon more proximal units, i.e. does the stratigraphically highest unit represent the most distal unit? 2) related to the former question, do the nappe units young upwards as would be expected from simple imbrication and stacking of the continental margin? 3) what age are the cross-cutting rocks described in some units and do they correlate with



Figure 8.4. Thin section photomicrographs of sampled Middle Allochthon gneisses.

Sveconorwegian, Neoproterozoic or Caledonian events recorded elsewhere? 4) Do any of the nappe units correlate with Mesoproterozoic autochthonous rocks within the region? To answer some of these questions, one sample was collected and analysed from each of five different nappe units.

# 8.4 Sample Description

### 8.4.1 SA8-32 Holmasjø Unit (fine-grained intermediate grey gneiss)

SA8-32 is an aphyric massive fine-grained grey gneiss of intermediate composition. The sampled outcrop comprises decimetre scale bands of aphyric and feldspar-phyric units of similar composition that feature a weakly developed planar fabric. The outcrop was poorly exposed so that tracing with other units was not possible, but the location matches the description of metaandesitic gneisses previously dated at 1145 Ma (Sigmond & Andresen 1976). The sample is composed of fine to medium-grained quartz, feldspar, amphibole, biotite and epidote, with abundant retrogression of biotite and amphibole to chlorite. Separated zircons are prismatic, elongate and feature oscillatory zoning. Some grains feature truncations between cores and outer zones, and many feature thin CL-bright rims.

### 8.4.2 SA8-19 Storhei Unit (coarse-grained granitic gneiss)

SA8-19 is a weakly deformed coarse-grained granitic gneiss. The sample was taken from poorly exposed weathered outcrops on the summit of Vardanuten. Other lithologies in the area include white feldspar-rich veins, and migmatitic gneisses with well-developed leucosome formation. The location correlates with the charnockitic gneisses mapped by Sigmond (1975). The sample comprises quartz, feldspar, actinolite and biotite. The mafic minerals are variably distributed and occur as individual laths, schlieren, or up to 3cm-across aggregates in less-foliated areas. Feldspars are both plagioclase and microcline, and also feature myrmeckite development. Opaque grains are complex and include rutile overgrowths on ilmenite. Exsolution textures are visible in the opaques and in the other mafic minerals. Although no pyroxene or garnet was observed, the exsolution and overgrowth textures suggest a possible relic high-grade metamorphism. Separated zircons are generally elongate and oscillatory zoned, often featuring irregular zones or embayments that may represent alteration and/or metamictisation. Truncations between core and outer zones exist in some grains, and a few also feature CL-bright rims.

## 8.4.3 SA8-23 Dyrskard Unit (fine-grained felsic gneiss)

SA8-23 is a fine-grained quartz-feldspar gneiss with a strong planar fabric. The outcrop features bands (likely originating as bedding) of this felsic gneiss, along with bands of more intermediate composition which are typically feldspar phyric. The outcrop matches the description of acidic banded gneisses that occur in the upper parts of the Dyrskard Unit (Gabrielsen 1980). The sample is composed of fine-grained quartz, feldspar, biotite, muscovite, epidote and opaque grains. A fabric is

seen as alignment of mica laths, and development of coarser bands of quartz and feldspar. The geochemistry of the sample (figure 8.7) indicates a rhyolitic protolith was likely for this sample. Separated zircons are prismatic, generally elongate, and feature regular oscillatory-zoning. There is a lack of truncations between growth zones, and the grains do not exhibit any metamorphic or alteration rims.

### 8.4.4 SA8-26 Kvitenut Unit (mylonitic banded gneiss)

SA8-26 is a mylonitic gneiss comprising mm- to cm-scale alternating pink, grey and black bands. The sample is taken from the base of a cliff which is interpreted to be the base of the unit; the outcrop comprises mylonitic banded gneisses of varying composition. Felsic bands within the sample comprise quartz, feldspar, and minor biotite, epidote and titanite grains. The more mafic bands comprise a much greater content of biotite, but also feature abundant coarse grains of titanite, epidote minerals and a pale amphibolite. These grains are fairly spherical and rounded, and likely originate as phenocrysts that have been rounded during mylonitisation. The protolith of the sample is not obvious, the description of the unit refers to granodioritic and granitic gneisses (Naterstad et al. 1973), which is generally appropriate for the sampled outcrop; however, it is not clear whether the alternating bands of different composition represent sheared igneous lithologies, or banding due to a sedimentary origin. Separated zircons are of various morphologies and textures, commonly oscillatory zoned, but also sector zoned and some with no obvious zonation; the variety of zircons suggests a sedimentary protolith may be appropriate. CL-bright rims occur on some grains not treated by chemical abrasion (see 8.6); after treatment the chemically abraded grains are often skeletal.

### 8.4.5 SA8-27 Revsegg Unit (garnet two-mica gneiss)

SA8-27 is a mica-rich gneiss quartz-feldspar gneiss, with quartz and feldspar occurring as both finegrained matrix minerals, and also as cm-scale pods. Boudinaged amphibolite pods exist in the sampled area and are concordant to the structural fabric. The sample represents the two-mica gneiss that occurs in the basal part of the unit (Naterstad et al. 1973). Biotite and muscovite are the dominant minerals, and form an anatomising extensional shear fabric. Garnet is abundant, and forms small euhedral grains that are both cross-cutting and aligned to biotite cleavage. Chlorite that has replaced biotite during retrogression is weakly developed. Kyanite was not seen in the thin section but was abundant in the mineral separate, and thus likely forms distinct horizons within the gneiss. Separated zircons exhibit a wide variety of morphologies and textures, which is compatible with a sedimentary origin for the protolith; the abundance of mica suggests a semi-pelitic composition. The chemically abraded grains are typically skeletal, whereas the untreated grains are rounded and commonly feature oscillatory zoning.

# 8.5 Analytical Methods

Analytical methods follow those described in Chapter 3 (U-Pb), Chapter 4 (whole-rock geochemistry) and Chapter 5 (Lu-Hf).

# 8.6 Results – U-Pb

### 8.6.1 SA8-32 Holmasjø Unit (fine-grained intermediate grey gneiss)

Ten non-abraded zircon grains were analysed and all gave nearly concordant ages. Nine out of ten analyses provide a weighted mean  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  age of 1497 ± 6 Ma, with a MSWD of 2.3. The rejected analysis has a slightly younger  ${}^{207}\text{Pb}/{}^{206}\text{Pb}$  age of 1464 ± 10 Ma, and may reflect modest lead-loss due to Sveconorwegian or Caledonian events. The 1497 Ma age is interpreted to represent the crystallisation age of the igneous protolith.

### 8.6.2 SA8-19 Storhei Unit (coarse-grained granitic gneiss)

Nineteen chemically abraded zircons grains were analysed; these were all nearly concordant but gave a spread of ages. Nine overlapping grains form a defined group at  $1480 \pm 20$  to  $1512 \pm 12$  Ma. Three overlapping grains form a slightly younger group at  $1421 \pm 22$  to  $1456 \pm 19$  Ma. Five concordant grains are dated at  $1198 \pm 18$ ,  $1251 \pm 32$ ,  $1302 \pm 18$ ,  $1323 \pm 25$ ,  $1365 \pm 26$  Ma. The two youngest grains are dated at  $1021 \pm 23$  and  $1024 \pm 27$  Ma. Some of the ~1100-1400 Ma grains appear to have analyses that overlap different growth zones; however this is not applicable to all of this population. The age population is interpretable in a number of ways. The sample may represent a sedimentary protolith with a detrital zircon population. Or, the sample may represent a ~1500 Ma protolith with Sveconorwegian overprinting, with ages representing mixtures of these ages. Or, the sample may represent a ~1500 Ma protolith with younger ages representing lead-loss, and Sveconorwegian ages representing new growth. The ~1500 Ma population of zircons feature similar oscillatory zoning and morphologies, with dark outer growth bands. Younger grains also feature similar characteristics. The two Sveconorwegian grains feature more diffuse zoning and less prismatic morphology. A sedimentary origin of these zircons is thus unlikely as a greater variety of morphologies is likely to exist in this case. Since some of the analyses cross different growth zones, some mixing between ~1500 Ma and ~1000 Ma may have occurred. The favoured interpretation is that the two Sveconorwegian grains are new zircon growth during this orogenic event. Lead-loss may have produced some of the younger ages, but is unlikely to be the sole cause in the spread of ages. Thus, the age population is interpreted as a ~1500 Ma protolith age, and a zircon-growth event at ~1020-1030 Ma.

### 8.6.3 SA8-23 Dyrskard Unit (fine-grained felsic gneiss)

Eleven chemically abraded zircon grains were analysed; these were all relics of oscillatory-zoned prismatic grains. All eleven analyses provide a weighted mean  ${}^{207}$ Pb/ ${}^{206}$ Pb age of 1062 ± 4 Ma with



Figure 8.5. Selection of zircon grains and results of U-Pb dating, shown as concordia plots and cumulative probability plots for detrital samples (excluding grains with >10% discordance).

a MSWD of 1.01. The analyses are concordant to weakly reversely discordant; one grain is strongly reversely discordant, but has a  $^{207}$ Pb/ $^{206}$ Pb age that is equivalent to the mean of the group at 1060 ± 20 Ma. The reverse discordance is likely related to inter-element fractionation differences between the sample and standard as a consequence of chemical abrasion (see Chapter 3). The 1062 Ma age is interpreted to represent crystallisation of the igneous protolith.

### 8.6.4 SA8-26 Kvitenut Unit (mylonitic banded gneiss)

41 chemically abraded zircon grains were analysed. 4 inferior analyses were rejected due to high common lead or low <sup>207</sup>Pb signals. 6 of the accepted grains have normal discordance greater than 10%. A multi-age population is exhibited, ranging from 979 to 1674 Ma. On the cumulative probability plot three major peaks are displayed at 1.01 to 1.06 Ga, 1.46 to 1.5 Ga, and at 1.6 to 1.67 Ga. These correspond to early- Sveconorwegian, Telemarkian and early-Gothian magmatic episodes respectively. There are two other concordant grains dated at 1278 ± 12, and 1362 ± 13 Ma. The youngest grain has a <sup>207</sup>Pb/<sup>206</sup>Pb age at 979 ± 29 Ma. The analyses were nearly all conducted on inner cores of grains. Each peak in the cumulative probability plot is represented by zircons with varying morphologies and zoning patterns, suggesting a detrital origin for the zircons, and thus a sedimentary origin for the protolith. The grains are sub-rounded which is compatible with this interpretation, although the chemical abrasion has masked this to an extent. The youngest grain suggests deposition of the protolith after 979 ± 29 Ma, multiple analyses of this grain. A significant population (n=6) of varying morphologies ranging from 1013 to 1062 Ma indicates the maximum age of deposition is younger than this population.

## 8.6.5 SA8-27 Revsegg Unit (garnet two-mica gneiss)

30 chemically-abraded zircon grains and 31 untreated grains were analysed. 2 analyses were rejected due to high common lead or a low <sup>207</sup>Pb signal. 5 of the accepted grains had discordance greater then 10%. A multi-age population is exhibited, ranging from 800 to 1795 Ma. On the cumulative probability plot a major peak is displayed at 0.9 to 1.06 Ga (27 grains). Smaller peaks are at 1.73 to 1.8 Ga (4 grains), at 1.5 Ga (4 grains) and at 1.15 Ga (2 grains). Two other grains are concordant at 0.8 and 1.61 Ga. The three youngest grains have ages of 468 ± 11, 500 ± 14, and 488 ± 14, and occur on CL-dark outer zones and a bright metamict core respectively. The range in morphologies and zoning patterns is compatible with a detrital origin. The ~940 to 960 Ma grains exhibit a range in morphologies, mostly with oscillatory zoning; the 800 Ma analysis is from a core of a grain with zoning typical of igneous zircons. The 470-500 Ma analyses are conducted on outer growth-zones and a metamict core, and are interpreted as zircon growth and metamictisation during early-Caledonian events. In this case, deposition is constrained to be younger than the ~940-960 Ma population, and possibly as young as <800 Ma if this grain represents a true detrital age.

## 8.7 Results – Hf

Each of the three samples interpreted as having igneous origins (SA8-32, SA8-19, SA8-23) has a range in  $\epsilon$ Hf<sub>(T)</sub> of three to four epsilon units, which is within the range of analytical error (typically  $\pm 2\epsilon$ ). Weighted average  $\epsilon$ Hf<sub>(T)</sub> values are 6.0  $\pm$  1.0 for SA8-32 (MSWD = 2.2), 2.5  $\pm$  0.9 for SA8-23 (MSWD = 1.9) and 2.1  $\pm$  1.0 for the ~1500 Ma population of SA8-19 (MSWD = 1.5). These values overlap the field for autochthonous basement of Sveconorwegian and Telemarkian age (Figure 8.6).



Figure 8.6.  $\epsilon$ Hf<sub>(T)</sub> vs. Time (Ma) for HRNC gneisses compared with data for autochthonous basement rocks in SW Fennoscandia (grey fields). Fields are plotted from data in Chapters 5 and 6, and Andersen et al. 2002b, 2004a, 2007b, 2009a; Andersen & Griffin 2004; Pedersen et al. 2009. SA8-23 and SA8-32 are shown as weighted mean averages with the black error bars representing the total range of values including 2sigma error. The 1500 Ma population of SA8-19 is also shown as a weighted mean value. The rest of the SA8-19 data and SA8-27 and SA8-26 are shown as individual analyses with grey error bars representing 2sigma. The depleted mantle (DM) value of Griffin et al. (2000) is used, along with the CHUR values of Bouvier et al. (2008).

The evolution of Lu-Hf in a closed-system zircon will be different to that in a piece of crust due to the difference in the abundance of these elements. Evolution lines are drawn in figure 8.6 for typical continental crust (Lu/Hf = 0.015) and for the average zircon concentration (Lu/Hf = 0.0009), starting at the 1500 Ma population of SA8-19. The younger zircons of this sample have errors in  $\epsilon$ Hf<sub>(T)</sub> which overlap both of these evolution lines, thus, the Hf data cannot distinguish between a lead-loss or mixed age origin for these younger grains.

The detrital samples (SA8-26 and SA8-27) have  $\epsilon Hf_{(T)}$  that broadly correlate with the autochthonous basement rocks (Figure 8.6). There is an abundance of 1650-1700 Ma age grains that do not correlate in age with the basement, however, this likely results from sampling bias, since

1650-1700 Ma age rocks are common within the Eastern Segment and within the Western Gneiss Region (e.g. Tucker et al. 1990; Åhall & Connelly 2008) but do not have published Hf data.

# 8.8 Discussion

## 8.8.1 Origin of the nappe units

### Holmasjø Allochthon

The ~1500 Ma age for the intermediate gneiss (SA8-32) from the Holmasjø allocthon correlates with the Telemarkian (1520-1480) age for much of the autochthonous basement within the region (Bingen et al. 2005b; see Chapter 3). Thrust faults within the unit have been observed to cut down locally into this autochthonous basement (Andresen & Færseth 1982). The displacement of the unit is in the order of several tens of kilometres (Andresen & Færseth 1982). Thus, it seems likely that the sample is from a slice of basement that is locally derived (<100km displacement), and has been imbricated with younger allocthonous phyllites during Caledonian thrusting.

### Storhei Gneiss

The Buadal and Storhei nappe units that make up the crystalline allochthonous units in the Suldal region have little known about them. In the sampled area (east of Saudafjord) the rocks are assigned to the Storhei Nappe, with charnockites occurring in the upper section (Sigmond 1978). The relationship between the charnockitic rocks and the amphibolite-facies gneisses that comprise the rest of the unit is unknown (Sigmond 1978). During this study, the relationship between supposed charnockitic rocks and other gneiss units was not observed due to poor exposure. Definite charnockite lithologies were also not observed, even when they were previously mapped as charnockite. Thus, the possible relic granulite-facies history of gneisses in the Storhei Unit remains to be explored.

The ~1500 Ma age and  $\epsilon$ Hf<sub>(T)</sub> of the Storhei gneiss is similar to that of the Telemarkian age crust that dominates the autochthonous rocks (Figure 8.6). Based on the assumption that the sampled rock has an igneous origin, the Storhei nappe likely comprises Telemarkian crust that existed northwest of the present coastline prior to Caledonian shortening. It is not known whether the sampled gneiss has been disrupted by younger intrusive units, or if high-grade metamorphism occurred at ~1020 Ma or at a younger age. However, granulite-facies rocks are recorded at Stavsnuten in the Kvitenut unit (Andresen 1974), therefore a possible correlation with this adjacent Middle Allocthon unit may exist in terms of metamorphic history.

### Dyrskard Unit

The quartzite-dominated sediments and bimodal volcanics of the Dyrskard Unit are interpreted to have formed in a continental margin environment (Gabrielsen 1980). The geochemistry of the dated

metarhyolite (Figure 8.7) has a signature indicative of a supra-subduction setting (e.g. enriched LILE & negative Nb, Ti, P anomalies). The geochemistry is strikingly similar to metarhyolites (Trossovdal Fm.) of the ~1260 Ma Saesvatn-Valldall sequence that are interpreted to have formed in a continental-rift or back-arc (Bingen et al. 2002; Brewer et al. 2004), that also comprise bimodal volcanics and intercalated sediments. The 1062 Ma age and geochemistry for the Dyrskard metarhyolite is also correlative with autochthonous early-Sveconorwegian granitoids that occur in the region (Chapter 6). These granitoids are related to an E/NE dipping subduction zone that was active prior to continent-continent collision at ~1035 Ma (Bingen & van Breemen 1998; Slagstad et al. 2008), although granitoids of this suite have also been interpreted to result from crustal thickening during Sveconorwegian orogenesis (Bingen et al. 2008c). The geochemistry and sedimentology of the Dyrskard supracrustals is interpreted here to represent deposition in a shallow marine environment located on a fore- or retro-arc foreland basin. This is compatible with the existence of an early Sveconorwegian arc located on the Fennoscandian margin (Slagstad et al. 2008).



Figure 8.7. Primitive mantle normalised (Sun & McDonough 1989) plot of the Dyrskard metarhyolitic gneiss (SA8-23) compared with the ~1260 Ma Trossovdal metarhyolite (Brewer et al. 2004), and ~1050 Ma Feda suite granitoids (see Chapter 6).

## Kvitenut and Revsegg Units

The Kvitenut and Revsegg metasedimentary gneisses were deposited after the main Sveconorwegian orogenic phase within the region (1035-1000 Ma; Bingen et al. 2008c), with single detritus zircon ages suggesting deposition after 979 Ma for the Kvitenut Unit, and possibly as young as <800 Ma for the Revsegg Unit. There are no exact minimum age constraints on the deposition of the sediments, except that they have been deformed during Caledonian orogenesis, with interpreted new zircon growth at ~500 Ma in the Revsegg Unit.

The Revsegg paragneiss contains a much greater content of Sveconorwegian age zircons than the Kvitenut paragneiss, with fewer early-Mesoproterozoic zircons (see Figure 8.8). This may be

related to uplift and increased weathering of the Sveconorwegian-aged crust during the early Neoproterozoic, as has been interpreted for correlative deposits in NW Scotland (Kirkland et al. 2008b). The oldest grains in both samples are c. 1700 Ma, suggesting that 1500-1700 Ma Telemarkian-Gothian crust may have had enough relief to inhibit flow of detritus from Archaean-Palaeoproterozoic sources, this feature has also been attributed for sedimentary deposits in Scotland and Greenland (Cawood et al. 2004).

The metasedimentary lithologies within the Kvitenut and Revsegg units are poorly described; however, the Kvitenut Unit is dominated by quartz-feldspar-rich gneisses, whereas the Revsegg Unit is dominated by mica-rich gneisses. Thus, it seems reasonable to interpret the Revsegg Unit has having a more distal marine origin than the Kvitenut Unit, with mica gneisses in the former representing more pelitic protoliths.

Late Mesoproterozoic to Neoproterozoic sedimentary sequences are found throughout the North Atlantic Region, in both autochthonous and allochthonous positions, for a review of ages and correlations see Cawood et al. (2007) and Kirkland et al. (2008b). In the Scandinavian Caledonides, detrital zircons from sedimentary units have been dated hitherto from allochthonous units in south-central Norway (Valdres; Bingen et al. 2005a, 2009), in the central Norwegian-Swedish Caledonides (Seve-Köli nappes; Ladenberger et al. 2009), and in the northernmost Norwegian Caledonides (Kalak Nappe Complex; Kirkland et al., 2006, 2007).

The Kalak Nappe Complex (KNC) has been assigned to the Upper Allochthon but has a debated origin. Recent work has postulated an exotic origin for the KNC, based on the fact that 850-690 Ma igneous intrusions dated within the allochthon are not found in the Fennoscandian autochthon (Kirkland et al. 2006, 2007; Corfu et al. 2007). However, palaeocurrent data from sediments in the lower part of the KNC favour a Fennoscandian source (Roberts 2007). As highlighted by Roberts (2007), the argument for an exotic origin of the KNC is based on negative evidence, i.e. the fact that igneous rocks of the appropriate age are not currently known from the autochthon. The Kvitenut and Revsegg units may provide insight into this argument, as they comprise metasedimentary rocks that correlate in depositional age with those in the KNC (<~980 Ma), and that are cross-cut by igneous units.

In the central Scandinavian Caledonides, the allochthonous rocks from bottom to top are: mylonitic granites and psammites, the Särv Nappes, the Seve Nappe Complex (SNC) and the Köli Nappes. These originate as the imbricated Fennoscandian basement, continental margin sediments, continent-oceanic transition zone, and Iapetus-derived oceanic terranes. The Dyrskard-Kvitenut-Revsegg allochthon can be correlated with the lower part of the sequence, comprising basement

slices and shallow marine to continental shelf deposits. The U-Pb detrital signatures recorded from the Kvitenut and Revsegg units are also comparable to metasedimentary units from the lower Seve nappe (Ladenberger et al. 2009), which has deposition <850 Ma, and peaks at 1000, 1400 and 1650 Ma.

In the Seve-Köli Complex, the Seve nappe units have reached granulite-facies metamorphism during Caledonian orogenesis (Claesson 1987), whereas the underlying Sarv and Offerdal nappes and the overlying Köli nappes are lower grade. This has lead to the ductile extrusion of the high-grade Seve Nappe Complex being compared to the channelised flow model for the Himalayan orogeny (Ladenberger et al. 2009). The Dyrskard-Kvitenut-Revsegg allochthons has similarities to the SNC, with the central Kvitenut complex preserving higher-grade metamorphism and migmatisation than the overlying Revsegg and underlying Dyrskard units. Further work is needed to elucidate whether these units were extruded in a large orogen-scale channel, or whether they were emplaced as separate nappe complexes at different times.

Metasedimentary units within Scotland correlate in age with the studied Kvitenut and Revsegg paragneisses. Detrital age patterns show some similarities; however, those in Scotland have been correlated with a Laurentian source (see Cawood et al. 2007). In the central Scandinavian Caledonides, sedimentary units from both the Lower and Middle Allochthons have been dated using detrital zircons (Bingen et al. 2005a; 2009). The zircon populations are similar to those dated here from the HRNC, and to those from the other regions discussed above, however, a population of grains at  $620 \pm 14$  Ma in the Lower Allochthon constrains an Ediacaran maximum age of deposition (Bingen et al. 2005a). Because the minimum age of deposition for the sedimentary units is not constrained, it is not known whether the Kvitenut and Revsegg Units correlate with this Ediacaran period of deposition, or with older Tonian (1000-850 Ma) deposits such as those in the Kalak Nappe Complex.

Distinguishing between a Laurentian and a Fennoscandian source is problematical, as the tectonothermal evolution of both continents is very similar throughout the Palaeo- to Mesoproterozoic. In a recently proposed model, post-Sveconorwegian sedimentation occurred in the North Atlantic region in the Asgard sea that formed by the clockwise rotation of Fennoscandia in relation to Laurentia (Cawood et al. 2010); the sedimentary successions were affected by tectonothermal events (Renlandian – 980-910 Ma and Knoydartian – 830-710 Ma), defining the Valhalla Orogen. Events in the Valhalla orogen are tectonically discrete from those in the Sveconorwegian orogen, as they formed in an external accretionary orogen as opposed to the interior Sveconorwegian orogen (Cawood et al. 2010). Gaining further knowledge of the

tectonothermal events that have affected the HRNC will be useful in constraining correlations between this exterior orogen with events that affected the interior of the Rodinia supercontinent.



Figure 8.8. (Top) Cumulative probability plots of detrital units within the HRNC (Revsegg and Kvitenut) compared with ages from the autochthonous basement within SW Fennoscandia (compilation from Bingen & Solli 2009). (Bottom) Age compilation of magmatic (black bars) and metamorphic/anatectic (grey bars) events within Scandinavian Caledonian terranes, compared with protolith ages determined in this study (dark grey boxes). Grey vertical bars represent the time periods of the main Sveconorwegian orogenic phase and Telemarkian continental growth (Bingen et al. 2008a). See Table 8.1 for compilation of age data.

### 8.8.2 Gothian-Telemarkian continental growth

In Fennoscandia, the autochthonous basement underlying the Caledonian nappes youngs to the southwest, with the crust being divided into Transcandinavian Igneous Belt (TIB) 1850-1700 Ma, Gothian 1700-1520 Ma, and Telemarkian 1520-1480 Ma terranes (Åhäll & Connelly 2008; Bingen et al. 2008a). Crystalline units within the allochthonous nappes have similar ages to the autochthonous basement that underlies them, for example in the Telemark Sector the HRNC comprises ~1500 Ma rocks overlying ~1500 Ma basement, and to the north of this, the Jotun Nappe comprises 1650 Ma rocks that likely overlie 1650 Ma Gothian crust (Lundmark & Corfu 2008). The original position of the crystalline nappe units was likely to the west/northwest of their current position, and outboard of the current coastline. Thus, the southwesterly younging age pattern of the crust likely existed prior to any Caledonian orogenesis, and extended out to several hundred kilometres offshore of the current coastline (Figure 8.9).



Figure 8.9. The postulated original position of Middle Allochthon nappe units in the southern Scandinavian Caledonides is shown as grey ellipses. The dashed arrows show the likely post-Sveconorwegian shedding of detritus from the Fennoscandian continent into basins that formed sedimentary units in the upper parts of the Middle Allochthon (e.g. Kvitenut and Revsegg units). HRNC, Hardangervidda-Ryfylke Nappe Complex; JNC, Jotun Nappe Complex; DN, Dalsfjord Nappe; LN, Lindas Nappe (modified from Lundmark & Corfu 2008).

### 8.8.3 Sveconorwegian orogeny in SW Norway

Bingen et al. (2008c) divide the Sveconorwegian orogeny into a time-frame of four periods, based on events that occur throughout SW Fennoscandia. The Arendal Phase (1140-1080 Ma) is related to the collision between Telemarkia and the Idefjorden terrane, forming the highly tectonised Bamble and Kongsberg terranes, with the only effect of this in southwest Norway being continental sedimentation resulting from localised uplift (Bingen et al. 2008c). The Agder Phase (1050-980 Ma) corresponds to the main orogenic phase with continent-continent collision, and crustal thickening that peaked at ~1035 Ma (Bingen et al. 2008c). In Telemarkia the ~1050 Ma Feda Suite is related to either east-dipping subduction prior to continent-continent collision, or to melting of older calcalkaline crust during crustal thickening (Bingen & van Breemen 1998; Bingen et al. 2008c; Slagstad et al. 2008). The ~1062 Ma age for the Dyrskard supracrustals, and their likely setting in an extensional basin above a supra-subduction zone, is much more compatible with a continentalarc origin rather than a crustal thickening origin for the Feda granitoids.

# **8.9** Conclusions

U-Pb geochronology of allochthonous units within the HRNC has shown that the units are much younger than previously interpreted from Rb-Sr dates. The basal allochthon contains an intermediate igneous unit dated at 1493 ± Ma, interpreted to be a locally derived thrust slice of basement. In the Storhei Nappe, a granitic gneiss is dated at ~1500 Ma, and features Sveconorwegian metamorphism at 1020 Ma. Thus, Telemarkian age crust likely extended much further northwest than the current coastline prior to Caledonian shortening. The Dyrskard Unit is dated at ~1062 Ma, and is interpreted as a supracrustal sequence deposited in a shallow basin in a supra-subduction setting. This adds evidence to the argument that the early-Sveconorwegian history included continental arc magmatism (Feda suite) at ~1060-1040 Ma. The Kvitenut and Revsegg units contain sedimentary paragneisses deposited after the main Sveconorwegian orogenic phase <950-980 Ma. Further work is needed to establish the minimum age of deposition. Cross-cutting units in these allochthons may correlate with those in the Kalak Nappe Complex, aiding the debate on the origin of this allochthonous complex.

Table 8.1 Compilation of ages for Figure 8.8

Metamorphism and anatexis age:			Ма	±	
Middle South	Upper Jotun	Djupevik Leucosome	892	4	Lundmark & Corfu 2008
Middle South	Upper Jotun	Syenite to monzonite	907	11	Scharer 1980
Middle South	Upper Jotun	Granite	909	4	Lundmark et al. 2007
Middle South	Upper Jotun	Anorthosite, Hurrungane	913	3	Lundmark & Corfu 2008
Middle South	Lindas Nappe	Granulite, Holsnoy	929	1	Bingen et al. 2001a
Windows South	WGR	Granite. Hafslo	930	10	Corfu 1980
Middle South	Lindas Nappe	Charnockite, Lygra	932	+28/-36	Bingen et al. 2001a
Middle South	Lindas Nappe	Retrograded granuloite, Radoy	933	2	Bingen et al. 2001a
Middle South	Upper Jotun	Anatexis, Hurrungane	934	3	Lundmark et al. 2007
Middle South	Upper Jotun	Granite, Hurrungane	934	1	Lundmark et al. 2007
Middle South	Upper Jotun	Qtz-Monzonite and gabbro	941	10	Lundmark et al. 2007
Windows South	WGR	Quartz-monzonite, Hisaroy	949	3	Røhr et al. 2004
Middle South	Upper Jotun	Anatexis, Hurrungane	954	3	Lundmark et al. 2007
Windows South	WGR	Quartz-monzonite. Hisarov	987	10	Røhr et al. 2004
Windows South	WGR	Granite. Hafslo	1014	35	Corfu 1980
Middle South	Lindas Nappe	Granulite, Gaupas	1151	5	Burton et al. 1995
Windows South	WGR	Granite, Hafslo	1518	17	Corfu 1980
Protolith age:			Ma	±	
Kalak Nappes	Havvatnet imbricate	Litlefiord pegmatite	826	+5.4	Kirkland et al. 2006
Kalak Nappes	Havvatnet imbricate	Revsneshamn pegmatite	833	+8.9	Kirkland et al. 2006
Kalak Nappes		Granitic diklet near Lillefiord pluton	834	+19	Corfu et al 2007
Kalak Nappes	Havvatnet imbricate	Revsneshamn granite	839	+9.7	Kirkland et al. 2006
Kalak Nappes	Havvatnet imbricate	Littlefiord granite 2 samples	841	+6.5	Kirkland et al. 2006
Seve Nappes	Kebnekaise Nappe	Vistas Granite, Kebnekaise Mts	845	+14	Paulsson & Andréasson 2002
Kalak Nappes	Sorøy-Seiland	Fidvågvatnet foliated granite	851	+5	Kirkland et al. 2008a
Kalak Nappes	Sorøy-Seiland	Nordneset foliated granite	853	+4	Kirkland et al. 2008a
Kalak Nappes	Sorøy-Seiland	Lilleford granitic gneiss	876	+9	Corfu et al 2007
Middle South	Upper Jotun	Leucosome in garnet granulite. Diupevik	892	+4 4	Lundmark et al 2008
Middle South	Upper Jotun	Granitic permatite Rambera	927	+2.0	Lundmark et al 2008
Middle South	Upper Jotun	Granitic pegmatite Hurrungane	927	+3.2	Lundmark et al. 2008
Windows South	WGR	Granodiorite dyke. Ornfiell	942	+5/-3	Tucker et al. 1990
Middle South	Linner Jotun	Zoned granitic negratite Hurrungane	942	+2 7	Lundmark et al. 2008
Windows South	WGR	Permatite dyke discordant Breidalsvatnet	943	+5	Tucker et al. 1990
Middle South	Linner Jotun	Allanite-bearing permatite dyke, Hurrungane	950	+1 3	Lundmark et al. 2007
Middle South	Lindås Nanne	Jotunite-mangerite pluton Raday, mafic granulite	951	+2	Bingen et al. 2001aa
Middle South	Lindås Nappe	Jotunite-mangerite pluton Radøy, retrogranulite	951	+10/-4	Bingen et al. 2001
Windows South	WGR	Granodiorite dyke. Diupyatnet	951	+5/-3	Tucker et al. 1990
Middle South	Linner Jotun	Granitic peosome in banded anatexite Hurrungane	954	+3	Lundmark et al. 2007
Windows South	Øve-Vang	Granite Øve	954	+41/-33	Corfu 1980
Middle South	Lipper lotun	Massif anorthosite, Gudvangen guarry	965	+3.8	Lundmark et al. 2008a
Windows South	WGR	lølster granite, porphyritic guartz svenite	966	+3	Skår & Pedersen, 2003
Kalak Nannes	Kolvik nanne	Siedaoaivi aranite	973	+1.2	Kirkland et al. 2006
Windows South	WGR	Granite Havelo	976	+8	Corfu 1980
Kalak Nannes	Kolvik nanne	Hårvika granite. Harvikneset	978	+9.1	Kirkland et al. 2006
Kalak Nappes	Olderfierd pappo	Popuág granite	0.91	+6.0	Kirkland et al., 2006
Middle southern	HRNC	Dvrskard metarhvolite	1062	±0.5	this study
Middle South	Risberget Nappo	Augen gneise S of Opndal	1180	-1	Handke et al. 1995
Middle South	Pishorgot Nappo	Augon gnoise Kiöra Panningon	1100	±3	Handko ot al. 1995
Middle South	Pishorgot Nappo	Augon gnoise, Rrattvåg Vorpholmon	1100	±3 ±2.9	Handko ot al. 1995
WILGUIG SOULLI	isioneider inahhe	Augen grielee, brauvay, verprioritien	1190	±2.0	1 Idiluke et al., 1990

# Chapter 8 – Caledonian Nappe Provenance

Middle South	Lindås Nappe	Charno
Windows South	WGR	Hustad
Middle South	Upper Jotun	Gabbro
Middle South	Upper Jotun	Quartz
Middle South	Upper Jotun	Dioritic
Middle South	Upper Jotun	Leirung
Windows South	WGR	Coronit
Middle South	Dalsfjord Nappe	Pegma
Middle southern	HRNC	Holmas
Middle southern	HRNC	Storner
Widdle South	Daistjord Nappe	Svartni
Windows South	WGR	
Windows South	Upper Jolun	Alkali g
Windows South	Grong-Oldon	Coarso
Middle South	Lippor Jotun	Apatoc
Middle South	Upper Jotun	Charpe
Middle South	Dalsfiord Nanne	Monzo
Windows South	WGR	Quartz
Windows South	WGR	Quartz
Windows South	WGR	granite
Windows South	WGR	Microcl
Windows South	WGR	Granite
Windows South	WGR	Hustad
Windows South	WGR	Hustad
Windows South	WGR	Leucog
Windows South	WGR	Granite
Windows South	WGR	Migmat
Windows South	WGR	Migmat
Windows South	WGR	Graniti
Windows South	WGR	Tonalite
Windows South	WGR	Migmat
Windows South	WGR	Granite
Middle South	Upper Jotun	Jotunite
Windows South	WGR	Granite
Windows South	WGR	Layere
Windows South	WGR	Granite
Middle South	Lower Jotun	Quartz
Windows South	WGR	Granite
Windows South	WGR	Granite
Windows South	WGR	Migmat
Windows South	WGR	Granite
Middle South	Lower Jotun	Syeniti
Middle North	Akkajaure Nappes	Felsic o
Middle North	Akkajaure Nappes	Ruovdo
Middle North	Akkajaure Nappes	Ruovdo
Windows North	West Iroms	Plagioc
Windows North	Rombak	Granite
Windows North	West Iroms	Plagioc
Windows North	Lototen	Borge p
Windows North	Vvest Froms	Foliatio
Seve Nappes	Skarja Nappe	Banded
	Akkajaure Nappes	Cremite
Middle North	Akkoiouro Nonnoo	Cronite
Middle North	Akkajaure Nappes	Phonor
Windows North	L ofoton	Flageta
Windows North	Lofoten	Torset
Windows North	West Troms	Ersfior
Windows North	Lofoten	Flagsta
Middle North	Akkaiaure Nappes	Granite
Windows North	Lofoten	SWI
Windows North	Nordland windows	Monzo
Windows South	Central Norway	Coarse
Windows North	Fagervik complex	Tiukkfie
Windows North	Lofoten	Raftsur
Windows North	Lofoten	Borge
Windows North	Lofoten	Eidsfjo
Windows North	Vesterålen	Amphik
Windows North	Rombak	Granite
Windows North	Nordland windows	Protolit
Windows North	Nordland windows	Quartz
Windows North	Vesterålen	Felsic g
Middle North	Akkajaure Nappes	Granite
Windows North	Lofoten	Sund-@
Windows North	Lofoten	Eidsfjo
Windows North	Rombak-Kuokkel	Granite
Windows North	Nordland windows	Syenite
Windows North	Nordland windows	Syenite
Windows North	Vesterålen	Mafic g
Windows South	Central Norway	Weakly
Windows North	Lofoten	Hopen
Windows North	Lofoten	Hopen
Windows North	Hinnøy	Felsic g
Windows North	Ritsem window	Ritsem
Windows North	Lofoten	Løding

nockite gneiss, Lygra	1237	+43/-35	Bingen et al., 2001a
ad igneous complex, coronitic gabbro/dolerite	1251	±3	Austrheim et al., 2003
oro, Høgeloft, Tyin	1252	+28/-25	Schärer, 1980
tz monzonitic gneiss, Rambera	1257	±22	Lundmark et al., 2007
ic gneiss, Rambera	1257	±22	Lundmark et al., 2007
ngsmyran gabbroic complex, pegmatite pod	1450	±3	Corfu & Emmett, 1992
nitic metagabbro, Selsnes	1461	±2	Tucker et al., 2004
natitic gabbro, Stordalsvatn	1464	±6	Corfu & Andersen, 2002
asjø metaandesite	1497	6	this study
ei gneiss	1499	8	this study
humlevatnet pegmatitic leucocratic vein	1507	±4	Austrheim & Corfu, 2009
esdal gabbro complex, gabbro pegmatite	1621	+3	Skår & Pedersen, 2003
granite gneiss. Hurrungane	1630	+30	Lundmark et al 2007
tz svenite gneiss and leucosomes. Sognefiord	1633	+8	Skår & Pedersen 2003
se-grained granite. Blåfiellhatten granite	1633	+2.9	Roberts et al 1999
actic granitic graine, Dialjennation granite	1624		Lundmark et al. 2007
achitia two pyroyopo gropulito. Hurrungopo	1624	±3	Lundmark et al., 2007
	1034	±3.0	Confu & Anderson 2002
conite, Aitøy	1634	±3	Corru & Andersen, 2002
tz diorite, Altøy, vikanes unit	1641	±2.3	Skar et al., 1994
tz monzonitic granulite, Vilsvikvagen, Hisarøya	1646	±110	Røhr et al., 2004
te gneiss, Andalsnes	1647	ca.	lucker et al., 1990
cline granite gneiss, Hindrem	1652	ca.	Tucker et al., 1990
ite gneiss, Ingdal	1653	±2	Tucker et al., 1987
ad igneous complex, foliated granite	1653	±2	Austrheim et al., 2003
ad complex, monzodiorite, Lakseberga	1654	±1	Austrheim et al., 2003
ogabbro gneiss, Damvatnet	1657	+5/-3	Tucker et al., 1990
ite gneiss, Frei Island	1658	±2	Tucker et al., 1990
atite gneiss, Åstfjord, 2 samples	1659	±2	Tucker et al., 1990
atitic gneiss, tonalitic gneiss, Våvatnet	1659	ca.	Tucker et al., 1990
itic aneiss. Meisinaset	1659	ca.	Tucker et al., 1990
lite aneiss Asprona	1659	ca	Tucker et al 1990
atitic gnoise, grev tonalite gnoise. Karavdalen	1660	ca.	Tucker et al. 1990
ito gnoise. Ålvund	1660	ca.	Tucker et al., 1990
ite grielss, Alvuliu	1000	. Ca.	Lundmark et al. 2007
	1000	±2.1	Tueler et el 1000
te gneiss, Sagtjorden	1661	±2	Tucker et al., 1990
red migmatite gneiss, Breidalsvatnet	1662	+41/-29	lucker et al., 1990
ite gneiss, Sunndalsøra	1664	ca.	Tucker et al., 1990
tz monzonite, tyin	1666	+26/-23	Schärer, 1980
ite migmatite gneiss, Smiset	1672	ca.	Tucker et al. 1990
ite gneiss, Selsjord, Dombås	1678	ca.	Tucker et al. 1990
atite gneiss, leucosome + host, Tingvoll	1686	±2	Tucker et al. 1990
ite migmatite gneiss, Solsnes	1686	ca.	Tucker et al. 1990
itic to monzonitic gneiss, Tyin	1694	±20	Schärer 1980
c dyke, Sarek	1731	±5	Rehnström 2003
ddeváre svenite	1744	±10	Rehnström 2003
ddeváre svenite	1761	+9	Rehnström 2003
oclase phyric dyke. Ytre Kårvika	1767	+5	Kullerud et al. 2006
ite intruding supracrustal belt. Gautelis	1770	+9.7	Romer et al 1991
odaso phyric dyko. Blombakk	1772	+0	Kullorud et al. 2006
a pluton, folgio nogratito outting gabbro	1772	±9	Corfu 2004
is a sutting granite duke. Kattfierd complex	1773	±2	
ad manific marine dyke, Kattijord complex	1774	±o	Conu et al. 2003a
ed granilic gheiss, Skarja gheiss	1770	±4	Renstrom et al. 2002
a magmatic complex, syenite, Sarek	1776	±/	Rennstrom 2003
ite, Sjangeli	1778	±19	Romer et al. 1991
ite dyke, upper thrust sheet 5	1779	±7	Rehnström & Corfu 2004
ocryst gneissic granite, upper thrust sheet 5	1780	±2	Rehnström & Corfu 2004
tadøy complex, pegmatite in Napp gabbro	1789	±2	Corfu 2004
et pluton, granite, Langøy	1789	±1	Corfu 2004
ord granite, Kvaløya	1792	±5	Corfu et al. 2003a
tadøy complex, pegmatitic pod in gabbro	1793	±4	Corfu 2004
ite dyke cutting granite-diorite	1795	±4	Rehnström & Corfu 2004
ofoten pluton, Ballsdad mangerite, Vestvågøy	1795	±1	Corfu 2004
onite gneiss, migmatitic, Træna	1795	±3	Skår 2002
se porphyritic granite. Geitfiell granite	1795	+52/-49	Johansson et al. 1993
fiellet granite. Seiland	1796	+3	Kirkland et al. 2008
und pluton, charpockite, Austvådav	1706	+2	Corfu 2004
aluton, abbro. Vestvågav	1796	+1	Corfu 2004
iord complex, aparthasita, Langay	1790	±1	Corfu 2004
vikelite engleve. Duggedelen	17.50	±2	Confu 2004
indolite enclave, Ryggedalen	1796	±2	
ite, Svartdal	1796	±5.2	Romer et al. 1991
lith of migmatite leucosome, Sjona	1797	±3	Larsen et al. 2002
tz monzonite gneiss, Sjona	1797	±3	Skår 2002
c granulite, Vikan, Straumfjorden	1798	±1	Corfu 2007
ite, granite-diorite mingling, lower thrust sheet	1800	±2	Rehnström & Corfu 2004
-Ølkona pluton, mangerite, Flakstadøy	1800	±2	Corfu 2004
jord complex, monzonite, Langøy	1800	±3	Corfu 2004
ite, Vassijaure	1800	±4	Rehnström & Torsvik 2003
ite gneiss, Nesøy	1800	±3	Skår 2002
ite gneiss, Høgtuva, Melfiell	1800	±2	Skår 2002
granulite, enclave in Vikan gneiss	1804	+1	Corfu 2007
dv deformed tonalite	1818	÷- +6	Schouenhorg et al 1001
n nluton charnockite Austvågav	1860	70	Corfu 2004
n pluton, chamockile, Austragey	1000	±0 . 1	Corfu 2004
a gropulito, Blokkpasst, Blokker, Casting	1004	±1	Corfu 2004
granulite, Blokkneset, Blokken, Sigerfjord	1870	ca.	Corru 2007
m granite	1871	±11	Kennstrom & Corfu 2004
igen pluton, granite, Hinnøy	1873	±2	Cortu 2004

# Discussion

## 9.1 Crustal evolution in the Telemarkian (1.52-1.48 Ga) period

Based on their petrology, petrography and intrusive-relations, the orthogneisses exposed in the Suldal Sector are thought to represent mid- to upper-crustal, hypabyssal and supracrustal igneous rocks, intercalated together during the evolution of a mature volcanic arc complex (Chapter 2). This interpretation is backed up by the whole-rock geochemistry of the orthogneisses, which exhibit typical calc-alkaline subduction-related signatures (Chapter 3). This arc is referred to as the Suldal arc; U-Pb geochronology of various lithologies suggests that it was active from ~1475 to 1521 Ma (Chapter 3).

The geochemistry of the Suldal arc is indicative of continental crust that is thickened relative to typical island arc crust, suggesting a mature island arc or continental arc setting. In continental arcs, magmatism may be dominated by recycling of pre-existing crust as opposed to addition of new crust (i.e. mantle addition). Coeval continental-rift magmatism in the adjacent Telemark Sector involved voluminous magmatic underplating, and felsic magmatism derived from crustal anatexis, suggesting a significant thickness of lithosphere must have existed prior to 1.5 Ga. Zircon inheritance is often used to infer older deep crust; inheritance is almost non-existent in Telemarkian magmatism (see Chapter 3), meaning that such an inference cannot be made based on the zircon data.

As discussed in Chapters 4 and 5, Andersen et al. (2001, 2002b, 2004a, 2007b, 2009b), Andersen & Griffin (2004) and Pedersen et al. (2009) advocate the existence of a pre-1.5 Ga deep crust throughout southwest Fennoscandia; they base this hypothesis on scant inherited zircons in younger <1.5 Ga intrusions, low  $\epsilon$ Hf in a few <1.5 Ga zircons, and Nd and Sr isotopes in 1.5-1.6 Ga and <1.5 Ga granitoids that depart from a depleted mantle signature. The Hf-O data presented in Chapter 4 confirms that a component older than 1.5 Ga and comprising a high- $\delta^{18}$ O signature (e.g. weathered sediments), made a contribution to the 1.5 Ga Suldal arc magmatism. The addition of such a component did not occur purely by mantle recycling, i.e. contamination from subducted sediments, but must have involved some recycling of this older component within the crust (intracrustal recycling). However, intracrustal recycling of an older sedimentary component does not prove the existence of an extensive older deep crust; intracrustal recycling requires burial and remobilisation of older sediments, which can occur via a number of processes, such as closure of back-arc basins and underthrusting at subduction margins.

Combining all of the evidence, it is suggested that the Suldal arc and its ensialic back-arc rift (the Rjukan Rift in Telemark), developed on an attenuated continental margin which comprised a degree

of older Gothian-aged (>1600 Ma) sediments; although, an origin on a rifted continental fragment cannot be discounted.

### 9.1.1 'Indigenous' or 'Exotic' Telemarkia

Traditionally, the crust of the SSD was interpreted to have grown by successive westward accretion (e.g. Berthelsen 1980; Gaál & Gorbatschev 1987). Later on, the crust west of the Oslo rift (e.g. Telemarkia) was inferred to be a crustal block >1.65 Ga in age, based on limited zircon U-Pb ages (Ragnildstevt et al. 1994; Schärer et al. 1996; Birkeland et al. 1997). This led to a number of suggestions that the crust west of the Oslo rift formed a separate continental block or 'proto SW-Norway'; this block may have accreted between 1.58 Ga and 1.5 Ga (Åhäll et al. 1998, 2000, or during the Sveconorwegian orogeny (Cornell & Austin Hedgart 2004). The zircon evidence can now be regarded as inconsequential, because the U-Pb ages are interpreted to have a detrital origin (Bingen et al. 2005b). The crust exposed at the surface of the SSD has a general east to west younging pattern, which can be inferred to represent a younging of the crustal domains, and therefore a possible origin as sequentially accreted terranes. However, as pointed out by Pedersen et al. (2009), models which are based on the age of exposed crust, in some cases fail to account for the age of the deep crust. Conversely, it is argued that models using in-situ U-Pb-Hf data to account for the age of the deep crust, in some cases *explicitly* imply features such as extensive Palaeoproterozoic crust at depth, where the data only indicate that such crust may exist (Pedersen et al. 2009; Andersen et al. 2009b).

Formation of the Suldal arc is inferred to have occurred above an east-dipping subduction zone (see Chapter 4). Calc-alkaline granitoids formed in the Idefjorden terrane as young as 1.49 Ga (Pózer Bue 2008), and are likely related to the youngest expression of east-dipping subduction that formed the Hisingen Suite continental arc (Åhäll & Connelly 2008). The coexistence of this arc with the 1.5 Ga Suldal arc in Telemarkia can be explained by two models: 1) where the arcs formed above the same subduction zone, and were later translated by strike-slip faulting to their current position, and 2) where two different subduction zones produced two contemporaneous arcs. The first model is compatible with the strike-skip terrane model advocated by Andersen et al. (2004a), de Haas et al. (1999) and Bingen et al. (2001b), and originally proposed by Torske (1985). The second model is consistent with an exotic microcontinent model for Telemarkia (Bingen et al. 2005b), but is suggested to be incompatible with the isotope data (Andersen et al. 2001, 2002b, 2004a, 2009b).

There is some limited structural evidence for the terrane displacement model, including coeval sinistral strike-slip and reverse dip-slip sense of shear on the mylonite zone, characteristic of a transpressive tectonic regime (Stephens et al. 1996), and early SE-directed movements that were later partitioned into sinistral strike-slip movements (Park et al. 1991). U-Pb ages of detrital zircons

in various metasedimentary units also provide evidence for this model. Metasedimentary units deposited during the Telemarkian period (those that are >1.48 Ga), contain abundant Palaeoproterozoic zircons, particularly correlating in age with the ~1.75-1.9 Ga Transcandinavian Igneous Belt; they also contain Archaean zircons. There is a relative lack of zircons in the 1.7-1.6 Ga age bracket that correspond to the age of the crust to the east of Telemarkia; such zircons are abundant however in metasedimentary units within the Idefjorden Terrane. This suggests that the Telemarkia terrane was proximal to TIB and Svecofennian age parts of the Fennoscandian continent (or another continent of similar age), and was not shielded from such detritus by the Idefjorden terranes; the detrital zircon data are therefore compatible with a strike-slip displacement model (see Figure 9.1).



Figure 9.1. Strike-slip terrane displacement model, showing major lithotectonic domains and their relative motion (after Bingen et al. 2001b).

Whether the Telemarkia terrane is 'indigenous' or 'exotic' can be put down to semantics. For example, Japan has an origin as a rifted fragment of the Eurasian continent (e.g. Tamaki 1995); since rifting it has suffered a different history to that of the Eurasian continent, but after future closing of the Pacific Ocean (e.g. Maruyama et al. 2007) Japan will be accreted back onto Eurasian continental crust. After this juxtaposition, a study of the isotopic characteristics of the Japanese lower crust, and that of the adjacent Eurasian lower crust, may find very similar isotopic signatures due to their pre-rifting mutual history. The isotopic similarities of the lower crust could be used to



Figure 9.2. Compilation of detrital zircon U-Pb data for SW Fennoscandia, from Knudsen (1997), Åhäll et al. (1998), de Haas et al. (1999), Bingen et al. (2001b, 2002, 2003), Andersen et al. (2004a, 2004b),

interpret an 'indigenous' origin for the Japanese terranes, or, the contrasting characteristics of the upper crust could be used to interpret an 'exotic' origin.

Andersen et al. (e.g. 2004a, 2009b) use the isotopic signatures of magmatic rocks across SW Fennoscandia to interpret an indigenous origin for Telemarkia. Cornell & Austin Hedgardt (2004) use the contrasting ages of granites exposed at the surface across the Mylonite Zone to interpret an exotic origin for both the Idefjorden and Telemarkia terranes. The model described in the next section aims to satisfy all of the data.

### 9.1.2 A retreating accretionary orogenic model

Combining all of the previous geochronology and geochemical considerations, Ahäll & Connelly (2008) present a model for the evolution of SW Fennoscandia, from formation of the TIB to the end of the Gothian period (1.52 Ga). In their model, the various lithotectonic domains represent nearcontinuous oceanward-stepping (westward) crustal growth along a long-lived subduction zone; changes from continental to oceanic arcs are attributed to advance and retreat of Fennoscandia relative to the subduction trench. This geodynamic setting is consistent with a retreating accretionary orogen (Cawood et al. 2009); the advance and retreat of a subduction trench in relation to the continent is termed tectonic switching, and is an efficient way of producing continental crust (Collins 2002; Kemp et al. 2009). In their model, Åhäll & Connelly (2008) do not specifically refer to the nature of the lower crust, or the radiogenic isotopic characteristics of the crustal domains; their continental growth calculations however, do imply a relatively juvenile nature throughout. Åhäll & Connelly (2008) end their model at 1.52 Ga, based on the assumption that this is the age of the youngest subduction-related magmatism recorded in the Gothian terranes, but suggest that Telemarkia may represent a younger continuation of this oceanward-stepping westward crustal growth. The conclusions from this study indicate that their suggestion is consistent with the data, and thus it is postulated that the growth of Telemarkia is related to a long-lived subduction zone that also produced the Gothian terranes, and was initiated during TIB continental arc magmatism. As pointed out by Ahäll & Connelly (2008), Telemarkia may have been originally located further north along the margin of Fennoscandia (see Figure 9.1), but a southern continuation of Telemarkia or another crustal segment likely existed in its place, and was subsequently translated elsewhere; Telemarkia thus provides a proxy for the crust that existed outboard of the Idefjorden terranes.

The following issues have already been raised: 1) is Telemarkia indigenous or exotic to Fennoscandia? and 2) does Telemarkian growth represent recycling of older Fennoscandian crust or is Telemarkia a juvenile terrane? In the model of a retreating accretionary orogen, these issues are answered in the following way: 1) Telemarkia is built on attenuated continental crust of Fennoscandian origin, this explains the similarities in radiogenic isotopic character of the deep crust across the region; however, it is not unconceivable that the Telemarkian segment of crust rifted

away from the Fennoscandian continent, thus forming a continental ribbon (or microcontinent). Jostling between this and other terranes during the Sveconorwegian orogeny, means the Telemarkia block could be regarded as 'exotic' according to some terrane criteria, but its overall origin is with that of a SW Fennoscandian accretionary orogen, thus an 'indigenous' origin is preferred. 2) Because Telemarkia was built on a thin continental substrate, the arc magmatism involved a degree of recycling of this older continental crust; Telemarkia is therefore not considered to be an 'accreted juvenile arc'. Conversely, Telemarkian magmatism is not likened to Andean-type settings where thick continental crust exists and continental recycling dominates over mantle addition; a preferred analogue for Telemarkia is that of modern arcs in the western Pacific that originate as rifted continental ribbons, such as Japan.



Figure 9.3. Simplified model of a retreating accretionary orogen to explain the westward growth of continental crust in SW Fennoscandia in various arc settings. The continuous east-dipping subdcution zone and attenutuation of the continental margin means that the isotopic characteristics of the deep crust are retained for large horizontal distances. TIB = Transcandinavian Igneous Belt, SLM = Stora Le Marstrand, black hatching refers to crust of late-Palaeoproterozoic age. (Modified from Åhäll & Connelly 2008).

# 9.2 Crustal evolution in the Sveconorwegian (1.06-0.92 Ga) period

New U-Pb ages (Chapter 3) show that the Storlivatnet plutonic complex in the Suldal Sector does not fall into the group of post-collisional Sveconorwegian granites, as it formed much earlier; U-Pb

ages from the plutonic complex date intrusions at  $1039 \pm 15$ ,  $1047 \pm 7$  and  $1069 \pm 9$  Ma. Deformation of the pluton is inferred to have occurred between  $1047 \pm 7$  and  $1069 \pm 9$  Ma; although this provides evidence for Sveconorwegian deformation within the region, the effect of this orogeny on the U-Pb systematics within the basement rocks is minimal (see Chapter 3). Inheritance of >1.5 Ga crust was not recorded in Sveconorwegian rocks of this study.

Early to pre-Sveconorwegian granitoids feature both I-type and A-type geochemistry, postcollisional granites are all A-type; the origin of these two suites can be explained by changes in water content (and oxygen fugacity) in the melting region (see Chapter 6). A supra-subduction zone setting is favoured for the pre-collisional granites; this setting provided hydrous conditions for formation of I-type magmas. Subsequent granite suites formed in a collisional setting with crustal thickening, and then a post-collisional setting with associated crustal thinning. Throughout these different geodynamic regimes the heat flux that is required to produce granitic magmatism will have changed, however, Hf-O data suggest that the magma source stayed the same (see Chapter 6). The magma source advocated for the Sveconorwegian magmatism involved a large contribution from 1.5 Ga crust, and a smaller contribution from mantle-derived material that is ~1.2 Ga or younger. The magma source was mafic lower crust that had isotope and geochemical characteristics imparted from previous magmatic episodes. Partial melting and fractionation of this mafic lower crust produced parent magmas that then evolved to granitoid intrusions.

The conclusions of this study confirm that the Sveconorwegian period largely involved recycling and remobilisation of pre-existing continental crust, as opposed to addition of new crust.

# 9.3 The 'interorogenic' period

The period after Telemarkian continental growth and before Sveconorwegian reworking, i.e. 1.46-1.06 Ga, features intermittent and generally localised periods of magmatism and sedimentation. Magmatic activity is dominated by mafic volcanism, but also includes felsic volcanism which is likely a result of crustal anatexis produced by heat from mafic intrusions. In Telemarkia, volcanism is typically associated with sedimentation in rift basins, whereas in the Idefjorden and Eastern Segment terranes, magmatism is associated with crustal lineaments or mafic dyke swarms (see Chapter 7). Both the formation of extensional basins and the intrusion of mafic dyke swarms, can be related to inboard effects of a convergent margin existing to the west of the present-day coastline (Brewer et al. 2002; Brewer et al. 2004; Söderlund et al. 2006; Chapter 7); although the 1.2 Ga Tromøy block is the only preserved arc crust of this age (Knudsen & Andersen 1999). This interpretation means that convergent margin activity is recorded in SW Fennoscandia from ~1.8 Ga (Transcandinavian Igneous Belt) to ~1.05 Ga (Feda Suite; see Chapter 6). It is also worth noting that 1.69-1.50 Ga A-type Rapakivi suites in Sweden and Finland have also been interpreted as distal affects of convergent margin activity on the southwestern Fennoscandian margin; this is based on a temporal and spatial trend for the A-type suites that matches that of westward arc magmatism in the Idefjorden and Telemarkian terranes (Åhäll et al. 2000). Some ~1.85-1.75 Ga A-type suites in Finland have post-collisional tectonic settings advocated, i.e. magmatism related to lithospheric thinning after crustal relaxation (Eklund et al. 1998; Väisänen et al. 2000; Kurhila et al. 2010). In accepting the above interpretations, it is worth pointing out that for a 1 Gyr period (~1.8 to ~0.8 Ga) all tectonothermal, magmatic and sedimentary events in Fennoscandia can be in some way related to convergent margin tectonism, and thus, there is no call for any deep-seated mantle anomalies to explain any particular events.

### 9.3.1 The Hallandian-Danopolonian event

The term Hallandian was coined by Hubbard (1975) for metamorphism, anatexis and magmatic events around ~1.4 Ga in southwest Sweden. Christoffel et al. (1999) later defined the Hallandian as a thermo-magmatic event in the 1.44-1.38 Ga period. The term Danopolonian was used by Bogdanova et al. (2001) for tectonothermal events in the East European Craton between 1.5 and 1.4 Ga, and was related to a possible collisional orogeny between Baltica and another continent (probably Amazonia). More recently the informal term Hallandian-Danopolonian has emerged, and can be ascribed to any tectonothermal event in the 1.46-1.38 Ga period.

Ages between 1.46 and 1.42 Ga for new zircon growth/recrystallisation have been reported in veined gneisses in the south of the Eastern Segment (Christoffel et al. 1999; Söderlund et al. 2002). Magmatism in the Eastern Segment includes granitic to monzonitic intrusions ~1.4 to 1.36 Ga in age (Åhäll et al. 1997; Andersson et al. 1999, 2002; Christoffel et al. 1999; Möller et al. 2007); these include dehydrated charnockitic granites. Dehydration of a localised zone (<10m) of pre-1.46 Ga granitoid has been dated at 1397  $\pm$  4 Ma (Rimša et al. 2007). On Bornholm Island to the east of the Eastern Segment, granites and orthogneisses have crystallisation ages from ~1475 to 1445 Ma (Zarinš & Johansson 2008); an east-west trend is interpreted to have formed synchronously with the magmatism, and titanite ages are coeval to slightly younger than the magmatic ages suggesting slow-cooling.

In the Idefjorden terrane to the west of the Eastern Segment, there are bimodal granite-gabbro intrusions dated at ~1.5 Ga (Åhäll & Connelly 1998), ~1.46 Ga dolerite dyke swarms (Hageskov 1997; Åhäll & Connelly 1998), and intermittent granite magmatism at ~1.34 to 1.25 Ga (Persson et al. 1983; Piontek et al. 1998; Austin Hegardt et al. 2007). No well constrained 1.46-1.42 Ga zircon growth has been recorded from the Idefjorden terrane; the lack of Hallandian-Danopolonian metamorphism in the Idefjorden terrane is one of the arguments used for its exotic origin (Andersson et al. 2002; Cornell & Austin Hegardt et al. 2004).

Brander & Söderlund (2008) note that in the Hallandian-Danopolonian period there is a predominance of mafic intrusions in the north and felsic intrusions in the south, and interpret this as possibly being related to distal effects of an orogeny in the south. However, some of these mafic intrusions can also be interpreted as distal effects of convergent margin tectonism in the west (see Chapter 7; Söderlund et al. 2005). The Hallandian-Danopolonian event has not affected the Telemarkia terrane, and thus could be assumed to have only affected inboard terranes. However, it is possible that the Hallandian-Danopolonian did affect terranes to the west of Idefjorden, but that these terranes have now been replaced by the unaffected Telemarkia terrane, which until the Sveconorwegian was located further north along the Fennoscandian margin (see Figure 9.1).

Contemporaneous with 1.5-1.6 Ga arc magmatism and 1.46-1.38 Ga tectonothermal events in the southwest of Fennoscandia, the central and eastern parts of the East European Craton were host to rifting events; these can be interpreted as both back-arc responses to Hallandian-Danopolonian convergence, and to abortive break-up of the East European Craton (see Bogdanova et al. 2008 and references within).

# 9.4 A tectonic synthesis

Figure 9.4 depicts the building of Fennoscandia during the Proterozoic; the pre-1.85 Ga configurations are modified from Korja et al. (2006) and Lahtinen et al. (2009). During the period between 2.0 Ga and 1.8 Ga, various Archaean continental blocks amalgamated in collisional orogenies (Lapland-Savo, Fennia, Svecobaltic and Nordic orogens; Lahtinen et al. 2009); caught up within these orogenic belts were juvenile Palaeoproterozoic arc and microcontinental blocks. As well as collisional orogenies, the 2.1-1.8 Ga period involves retreating (Tersk, Kittilä, Savo and Häme) and advancing (Tampere, Bergslagen and TIB1) accretionary orogenic belts (Lahtinen et al. 2009). By 1.8 Ga, the Palaeoproterozoic and Archaean domains were amalgamated into a stabilised craton; Sarmatia and Volgo-Uralia had also amalgamated by this time to form the East European Craton (Bogdanova et al. 2008).

Subduction on the south and west margins of Fennoscandia that formed the TIB1 continental arc, marks the beginning of a long-lived retreating accretionary orogen. This accretionary belt was active until Sveconorwegian continent-continent collision at ~1.05 Ga. Crustal additions related to this accretionary belt are ~1.75 to ~1.48 Ga in age (Gothian and Telemarkian). The period between 1.48 and 1.05 Ga involved little net crustal addition; the preserved crust was likely in back-arc and inboard positions relative to the convergent margin, and outboard juvenile crust that may have been produced during this time has likely been lost via both subduction erosion, and terrane displacement.

Subduction and back-arc rifting in the Lapland-Kola area, westwards subduction under the Keitele mc and Norbotten mc, and subdcution to the NE under the Norbotten mc and east under the Keitele mc.



Beginning of the Fennian orogeny. As a result of locking of northward subduction under the Keitele mc, the southern ocean is consumed by subduction to the south under the combined Häme island arc and Bergslagen mc. After amalgamation of the Bothinan mc, another subduction zone is formed at its southern margin.



The subduction zone migrates oceanward relative to Fennoscandia. TIB 2/3 arc rocks form in an extensional continental arc.





Archaean and Palaeoproterozoic crust has formed and is largely stabilised. Subduction initiates to the north and east, large-scale extension takes place in the hinterland, and Fennoscandia amalgamates with Sarmatia.



Overall the subdcution zone is migrating oceanward, but periodic trenchward movement accretes Gothian and Telemarkian arc terranes to Fennoscandia. By 1.5 Ga most of the Fennoscandian crust is stabilised.



Figure 9.4. A schematic model for the amalgamation of Fennoscandian continental crust during the Palaeo- to Mesoproterozoic (modifed from Korja et al. 2006; Lahtinen et al. 2009). mc = microcontinent, IA = Inari Area, TT = Tersk Terrane, LGB = Lapland-granulite Belt, UGT + Umba Granulite Terrane, GAB = Göteborg-Åmål Belt, TIB = Transcandinavian Igneous Belt.



Figure 9.5. The distribution of metamorphism, magmatism and sedimentary basins during the Sveconorwegian orogeny (modified from Bingen et al. 2008c; Bogdanova et al. 2008).

Figure 9.5 depicts the Sveconorwegian orogeny in Fennoscandia, modified from Bingen et al. (2008c) and Bogdanova et al. (2008). Modifications to the model include the addition of the 1.07-1.04 Ga Storlivatnet pluton, and an east-dipping subduction zone that produced the >1.04 Ga granitoids.

# 9.5 Reading the isotope barcode

The tectonic model discussed in the previous section features a retreating accretionary orogen that was active from ~1850 Ma to 1050 Ma. The period of accretion was concluded by ~1030 Ma with a major continent-continent collision and reworking and reorganisation of terranes. The onset of this accretionary orogen is defined by an active continental margin that reworked previously formed crust (the Transcandinavian Igneous Belt); accretionary orogenesis also occurred prior to the TIB continental arc event, but the TIB allows for a convenient separation between >1.85 Ga Svecofennian and <1.8 Ga Gothian to Sveconorwegian events.

In the Gothian-Telemarkian orogen, the oldest (and exposed) upper crust youngs to the west, from ~1750 Ma in the east (Eastern Segment) to ~1480 Ma in the west (Suldal/Rogaland). Various episodes of arc magmatism have been recognised from combined field, geochemical and geochronological data, including Horred (1.66 Ga), Göteborg-Åmål (1.61-1.59 Ga), Hisingen (1.59-1.52 Ga), and Telemarkian (1.52-1.48 Ga) (Åhäll & Connelly 2008 and references within; Chapters 2 to 5). Back-arc and fore-arc sequences with arc-dominated greywacke sediment are generally restricted to the Idefjorden terrane, but are also found in the Bamble and Kongsberg collisional terranes. Younger extensional basins with continental or shallow sedimentation are found across the Telemarkia terranes, and magmatism that is not clearly arc-related occurs in various discrete episodes throughout the discussed time period (see Chapter 7 and section 9.3).

The Lachlan orogen in SE Australia is a younger example of a retreating accretionary orogen, where the coupling of arc and back-arc, and magmatic, metamorphic and sedimentary processes are well-documented (e.g. Collins 2002; Kemp et al. 2009; Foster et al. 2009). One method of continental crust formation in this orogen is the formation of S-type granites during closure of backarc basins. These granites form during a compressional state of the orogen, and have the most evolved Nd and Hf signatures relative to other suites in the orogen (Kemp et al. 2009). During the maximum extensional state of the orogen, A-type granites with the most depleted Hf and Nd signatures are produced (Kemp et al. 2009). I-type granites occur during the initial extensional phases in back-arc and fore-arc settings, and have mixed mantle and sedimentary isotope signatures (Kemp et al. 2007). The temporal variation in the isotopic signature of different granitoid suites is correlative with the geodynamic setting of magmatism. In its simplest terms, the amount of mantle addition to magmatism increases during the maximum extensional state of the orogen; this may reflect a variety of processes such as intrusion into thinned crust and/or intrusion along extensional structures, as well as a decrease in sediment-subduction or subduction-erosion. In the Lachlan orogen, the thickness of crust is postulated as the underlying cause of varying mantle/crustal contributions (Kemp et al. 2009).

Whereas the Lachlan orogen features marginal basins and large volumes of turbiditic sediments (Foster et al. 2009), the orogen studied here features voluminous arc crust, with limited volume of turbidites. Kemp et al. (2009) suggest such features are related to a quasi-stationary subduction zone, such as the Canadian Cordillera. In the Lachlan orogen the crust has been shortened by ~75% (Foster et al. 2009), in the Fennoscandian orogen, it is likely to be less than 50% given the lack of ocean basin formation. This difference in extension has produced the variance in volume of sediment versus igneous crust. The Fennoscandian orogen is also eroded to a deeper crustal level, implying that a greater volume of supracrustal material may have existed originally.

#### 9.5.1 Source versus time

Figure 9.6a shows a compilation of published and new Hf isotope data for SW Fennoscandian autochthonous basement domains. The data fall into clusters that from oldest to youngest are TIB1 and TIB2/3 arc-related units; Göteborg-Åmål, Hisingen and Telemarkian arc-related units; ~1.3-1.1 Ga interorogenic units; and 1.06-0.92 Ga Sveconorwegian granitoid units. Ranging from ~1.6 to 0.92 Ga are mafic intrusions that intrude terranes east of the Oslo Rift. The inter-orogenic rocks likely formed in a supra-subduction zone setting (see Chapter 7), particularly those in the Setesdalen region (Pedersen et al. 2009). Figure 9.6b shows averages of the data using 25 Myr bins; this enables the general trend in  $\epsilon$ Hf to be visualised.

TIB 1 and TIB 2/3 magmatism can be related to continental arc magmatism that involved a large proportion of recycling of pre-existing Svecofennian crust. The switch to arc magmatism forming the Göteborg-Åmål Belt (GAB) and Hisingen Suite (Åhäll & Connelly 2008), involved a change to a greater degree of mantle input; this change is interpreted to reflect slab rollback so that magmatism intrudes thinner crust, and that magmatism is more distal to the continent so that the volume of older subducted sediment is decreased. Between 1.6 and 1.5 Ga there were multiple episodes of back-arc/fore-arc sediment deposition (Stora Le-Marstrand formations), and accretion of arc-derived blocks (Åhäll & Connelly 2008); however, the data cannot pick out differences in mantle input at this timescale. During the following Telemarkian period, arc magmatism featured a slightly decreasing apparent mantle input. The Telemarkian arc were likely built upon the same crust that the GAB and Hisingen arcs were built upon, and features a slightly increased amount of crustal reworking.

The interorogenic period is represented by units within central and southern Telemarkia; this period begins with a relatively dominant mantle signature, which then decreases until ~1.22 Ga. At ~1.2 Ga there is another change to a greater mantle input, which again decreases over time. These perturbations in  $\epsilon$ Hf over time can be related to periods of maximum slab retreat at ~1.35 and ~1.2 Ga, such that magmatism occured in extensional settings or in thinned crust, where crustal

assimilation was limited. There were no perturbations relating to increased mantle input in the Sveconorwegian period, suggesting that the magmatism involved significant reworking of crust.

Mafic intrusions do not fall on the depleted mantle trend; this can be explained by two models, 1) where the mafic intrusions result from melting of older mafic lower crust, and therefore have evolved  $\epsilon$ Hf signatures, or 2) where the mafic intrusion result from enriched mantle domains. The latter was favoured by Söderlund et al. (2005), who postulated enrichment of lithospheric mantle via previous subduction episodes; however, some of the contemporaneous arc-related granitoids have more depleted signatures suggesting that a depleted mantle reservoir must have been available. Either the mafic intrusions and arc-related granitoids tapped different mantle sources, or the mafic intrusions comprise a degree of crustal anatexis or assimilation. Most of the mafic intrusions broadly correlate in time with inferred periods of extension; the ~0.95 Ga mafic intrusions can be explained by lithospheric thinning during orogenic collapse.

Perturbations in the  $\epsilon$ Hf trend to increased mantle input can largely be explained by slab retreat, extensional tectonics, and an increase in mantle addition to magmas; perturbations away from the mantle curve can be explained by compressive or collisional tectonics, and reworking of preexisting crust. Therefore in its simplest terms, these trends can be interpreted in the context of continental growth versus continental recycling (Figure 9.6b).

### 9.5.2 Comparison with other evidence

The temporal isotope trend provides a barcode of inferred compressional and extensional events that can be correlated with geodynamic events interpreted from alterative evidence; such evidence is documented below:

### 9.5.2.1 Compressive phases

Pre-1.65 Ga deformation in the Idefjorden and Eastern Segment is poorly constrained. As discussed previously, some deformation may be related to Hallandian-Danopolonian events. Owing to the existence of sedimentary units within the Idefjorden terrane, 1.6-1.5 Ga events are well-constrained compared to other time periods.

Deformation of the Horred arc, which is related to its accretion onto the Fennoscandian continent, is older than a cross-cutting granite at  $1578 \pm 7$  Ma; with the switch from island arc to continental arc magmatism at 1634 Ma suggesting accretion by this time (Åhäll & Connelly 2008). Volcano-sedimentary units within the Amal formation, of which a rhyolite is dated at  $1631 \pm 3$  Ma, contain source material from an adjacent granite dated at 1634 + 3/-2 Ma, suggesting rapid unroofing of a magmatic arc at 1.63 Ga (Åhäll & Connelly 2008). A sandstone unit with 1.62 to 1.59 Ga and a few older zircon grains is suggestive of closure of Göteborg-Åmål basins by this time (Åhäll &

Connelly 2008). Deposition and deformation of SLM 1 rocks is constrained to be younger than  $1591 \pm 8$  Ma by the youngest detrital zircon (Åhäll et al. 1998), and older than  $1587 \pm 3$  Ma based on a cross-cutting intrusion (Connelly & Åhäll 1996; Åhäll et al. 1998. Deposition of SLM 2 rocks is bracketed by the youngest detrital zircon to be <1.56 Ga, with cross-cutting intrusions at  $1545 \pm 5$  Ma and  $1546 \pm 7$  Ma suggesting accretion by this time (Åhäll & Connelly 2008). Regional migmatisation related to accretion of SLM 2 rocks is estimated at 1.54 Ga from U-Pb data on zircon rims (Åhäll & Connelly 2008). Åhäll & Connelly (2008) distinguish three phases of Hisingen magmatism, at 1.59-1.56 Ga, 1.56-1.55 Ga, and 1.55-1.52 Ga; the youngest phase truncates fabrics in the earlier phases. Deformation is bracketed between  $1563 \pm 2$  and  $1558 \pm 2$  Ma, and between  $1555 \pm 2$  and  $1553 \pm 2$  Ma (Connelly & Åhäll 1996; Åhäll & Connelly 2008) from deformed host rocks and post-kinematic dykes.

Zircon growth at ~1.46-1.42 Ga in Eastern Segment gneisses suggests a high-grade compressive event (see 9.3.1); however such an event is not recorded in the terranes that the ɛHf data are derived from. Deformation is not recorded after this event until the Sveconorwegian period. At ~1140 Ma high-grade metamorphism is attributed to collision between the Telemarkia and Idefjorden terranes, and formation of the Bamble and Kongsberg tectonised terranes (Bingen et al. 2008c). At ~1100-1080 Ma high-grade metamorphism propagated locally into the Idefjorden terrane; the main continent-continent collision phase with associated regional metamorphism occurred between 1050 and 980 Ma (Bingen et al. 2008c).

### 9.5.2.2 Retreating phases

Evidence for slab retreat could be interpreted in the form of extensional basins; within SW Fennoscandia these include: Stora Le Marstrand 1 (~1.59 Ga ), Stora Le Marstrand 2 (~1.55 Ga), the Rjukan Rift (~1.51 Ga), the Sæsvatn-Valldall Belt (~1.26-1.21 Ga), and formations within the Sveconorwegian Supergroup (1.19-1.14 Ga). The mafic intrusions at ~1.6, ~1.56, ~1.46, ~1.27, ~1.22, and ~0.95-0.97 Ga (Söderlund et al. 2005), can also be interpreted in the context of extensional phases.

In general, major compressional phases (high-grade metamorphism) correlate with gaps in the magmatic record, indicating a lack of magma production during these periods. Minor compressional phases, such as those between 1.6 and 1.5 Ga, do not have a resolvable affect on the isotope trend. The ages of extensional basins and mafic intrusion correlate fairly well with the slab retreat phases inferred from the isotope trends. The 1140-1080 Ma magmatic gap (that was previously recognised by Bingen et al. 2008c) correlates with the interpreted collision between Telemarkia and Idefjorden; this would explain the lack of magmatism in this central region of SW Fennoscandia. The lack of magmatism on the western margin of the region however, is interpreted to reflect a compressive period where previously formed crust was removed via subduction erosion; this can be used to

partly explain the lack of 1.3-1.14 Ga arc crust to the west of Telemarkia, which would correlate with the back-arc basins preserved within Telemarkia.



Figure 9.6. A) Compilation of  $\varepsilon$ Hf<sub>(initial)</sub> zircon and whole-rock data from units with igneous protliths within SW Fennoscandia, plotted versus time (Ma). DM is depleted mantle of Griffin et al. (2000); reference lines are showing evolution of crust with Lu/Hf = 0.015. B) All  $\varepsilon$ Hf<sub>(initial)</sub> data averaged at 25 Ma bins. C) Compilation of <sup>207</sup>Pb/<sup>206</sup>Pb zircon ages from various time periods within SW Fennoscandia, shown as cumulative probability plots. Grey bars represent the range of magmatic ages for each period.

### 9.5.3 Zircon Inheritance

Zircon inheritance has been repeatedly discussed within this study; in Figure 9.6c, a compilation of zircon  $^{207}$ Pb/ $^{206}$ Pb ages for different age bracketed periods is shown. The periods interpreted as reflecting continental arc magmatism are the GAB and Hisingen, these feature a greater proportion of older zircons than the TIB 2/3 and Telemarkian periods which are interpreted to reflect magmatism on attenuated continental crust in extensional settings. The lack of inheritance in the 1100-1320 Ma interorogenic units is compatible with their largely juvenile origin; whereas the abundance of ~1.5 Ga zircons in Sveconorwegian units is compatible with them involving a large proportion of crustal recycling (see Chapter 6). Thus, the interpreted geodynamic settings of these periods are compatible with the pattern of zircon inheritance.

# 9.6 Supercontinents and global correlations

## 9.6.1 A global accretionary orogen?

The Proterozoic history of other continents is briefly discussed to examine the extent of 1.8-1.0 Ga accretionary orogens.

### 9.6.1.1 Laurentia

Similarities between the Late Palaeoproterozoic to Mesoproterozoic history of Fennoscandia and Laurentia (Figure 9.7) were observed over two decades ago (Gower 1985; Hoffman 1988). The widely accepted extension of the Grenville orogen in Laurentia to the Sveconorwegian orogen in SW Fennoscandia, means that this connection, known as NENA (Northern Europe North America; Gower et al. 1990), has formed an integral part of most reconstructions of Rodinia (e.g. Li et al. 2008; Evans 2009). Correlations between late-Palaeoproterozoic orogenic belts, and the pre-Sveconorwegian growth of these continents, mean that the NENA connection is also generally correlated at least as far back as the formation of the NUNA (a.k.a Columbia) supercontinent (e.g. Hoffmann 1997; Zhao et al. 2002).

Whitmeyer & Karlstrom (2007) present a comprehensive tectonic model for the continental growth of Northern America during the Proterozoic; in this model, Laurentia grew along its southern margin from 1.8-1.0 Ga by progressive addition of dominantly juvenile arcs and oceanic terranes, in a setting analogous to modern day Indonesia. Crustal provinces in southern Laurentia include the Yavapai province (1.80-1.70 Ga) accreted during the 1.71-1.68 Ga Yavapai orogeny; the Mazatzal province (1.70-1.65 Ga) added during the 1.45-1.30 Ga tectonic event associated with A-type intracratonic magmatism; and the Llano-Grenville province (1.30-1.00 Ga) added during the 1.30-0.95 Ga Grenville orogeny (Whitmeyer & Karlstrom 2007).

In the easternmost part of the Grenville Province, crustal provinces include pre-Labradorian (1800-1770 Ma), early Labradorian (1680-1655 Ma), Mid-to late-Labradorian (1650-1630 Ma), Pinwarian (1520-1460 Ma), Mid-Grenvillian (1040-1020 Ma) and late to post-Grenvillian (1000-940 Ma) events (Gower et al. 2008). This crustal province, which is the closest spatially in Laurentia to Fennoscandia (excluding Greenland), has a strikingly similar history to that of SW Fennoscandia. Telemarkian magmatism in Fennoscandia has a direct correlation with the Pinwarian event, which also involves arc magmatism built upon Labradorian crust (Gower 1996; Gower et al. 2008). Further south, the Muskoka domain in the southwestern Grenville Province also has a striking similarity to Telemarkian events, with coeval to younger continental arc magmatism from 1480 to 1430 Ma, which involves intra-arc extension and contemporaneous A-type magma generation in a back-arc environment (Slagstad et al. 2004). The extent of Telemarkian age crust in Laurentia is extended across the continent by isotopic mapping using Nd model ages; Dickin & Higgins (1992) suggest a vast region of the central Grenville Province was part of a 1.5 Ga crust-forming event.



Figure 9.7. 1.8 - 1.0 Ga Crustal provinces in Laurentia and Fennoscandia (after Karlstrom et al. 2001).

As well as Fennoscandia, Laurentia is correlated eastward with Greenland and parts of the British Isles. The 1.9-1.78 Ga Makkovik province in the easternmost part of the Grenville Province is related to a continent margin setting with both juvenile Palaeoproterozoic and reworked Archaean components (Kerr et al. 1996; Ketchum et al. 2001). The Makkovik province is correlated with the

Ketilidean province of southern Greenland, which is a dominantly juvenile arc located on the edge of an Archaean domain (Chadwick & Garde 1996; Garde et al. 2002). Makkovikian-Ketilidean and pre-Labradorian provinces are correlated with the ~1.75 Ga Rockall Bank (Morton & Taylor 1991), the Rhinns complex in the Inner Hebrides (Muir et al. 1994), and the Annagh gneiss complex in Ireland (Menuge & Daly 1994). These dominantly juvenile belts which formed on the exterior of Palaeoproterozoic and Archaean domains are broadly correlative with the formation of the Transcandinavian Igneous Belt on the southwestern edge of the Fennoscandian continent.

### 9.6.1.2 Amazonia

The Amazonian craton comprises an Archaean core which is flanked to the southwest by successively younging Palaeo- to Mesoproterozoic lithotectonic domains, this feature is similar to that of the Fennoscandian Shield, and has led to correlations being made across the two continents (Geraldes et al. 2001; Cordani et al. 2009; Johansson 2009). The major geological provinces are: Central Amazonian (CAP - >2.3 Ga), Maroni-Itacaiúnas (MIP – 2.2-1.95 Ga), Ventuari-Tapajós (VTP – 1.95-1.80 Ga), Rio Negro-Juruena (RNJP – 1.8-1.55 Ga), Rondonian-San Ignácio (RSIP – 1.55-1.3 Ga) and Sunsás (SP – 1.3-1.0 Ga) (Tassinari et al. 1999). The VTP, RNJP and part of the RSIP represent a vast area of juvenile continental crust that was formed by accretion of magmatic arcs, whereas the younger domains are dominated by crustal reworking (Tassinari et al. 1999; Geraldes et al. 2001). The 1.55-1.30 Ga Rondonian-San Ignacio province involves a collisional orogeny involving a possible microcontinent, accretionary belts, and inboard plutonism (Cordani et al. 2009); a distinct correlation can be made with events of this age in Fennoscandia.

## 9.6.1.3 Australia

During the amalgamation of Rodinia, eastern Australia is typically connected to Laurentia either in the western US (AUSWUS, Karlstrom et al. 1999, 2001) or in northern Canada (SWEAT, Dalziel 1991; Hoffman 1991). A link between these continents is also made for the Nuna supercontinent, in which Australia is typically placed in a SWEAT–type position to the northwest of Laurentia (Betts et al. 2008). Palaeomagnetic data suggest Australia and Laurentia were contiguous from 1730-1595 Ma, but also permit a continued association until ~1200 Ma (Payne et al. 2009). However, a 1.6-1.5 Ga hotspot track in eastern Australia suggests that Laurentia and Australia diverged during this period, with Laurentia staying at low latitudes, and Australia drifting to high latitudes (Betts et al. 2007). Events in the 1.8-1.6 Ga period are particularly linked across Australia and Laurentia. In this period episodic orogenesis occurred along the southern margin of the Australian continent above a north-dipping subduction system, with the pattern of accretion suggesting southward migration of the subduction zone via slab rollback and oceanward stepping behind accreted blocks (Betts & Giles, 2006). Episodes of accretion that link Laurentia with Australia include the ~1780 Ma Yapunka-Yamba-Bow Medicine orogens, the ~1.74-1.7 Ga Strangeways-Kimban-Nimrod-Yavapai orogens, and the 1.65-1.64 Ga Leibig-Kararan-Maztazal orogens (Betts et al. 2008). Some of the

evidence used to infer a subduction zone setting on the southern margin has been refuted (Payne et al. 2010); instead convergence may have occurred under the eastern margin of the continent (Payne et al. 2009). The 1.5-1.4 Ga period is host to extension, basin formation and anorogenic magmatism (Betts & Giles 2006; Wade et al. 2007). After 1.5 Ga the South Australian Craton (Mawsonland) is postulated to have broken away from the North Australian Craton, and then to have reattached during the 1.33-1.1 Ga Albany-Fraser-Musgrave orogenies (Giles et al. 2004). The Australian continent appears to have had a more complex history of accretion, orogenesis and break-up than the southern margin of Laurentia and its extension into Fennoscandia; during the 1.8-1.5 Ga period it can still be considered to be part of an accretionary orogen, but a part which featured more recycling of older crust than juvenile addition (Betts et al. 2008).

### 9.6.1.4 China

China is split into two cratons, the South China Craton (SCC) and North China Craton) NCC; the SCC appears to be poorly constrained in terms of its Proterozoic history and lacks palaeomagnetic key poles, it therefore doesn't feature in some Nuna supercontinent reconstructions or has an unconstrained placement (e.g. Zhao et al. 2002). The NCC comprises two separate blocks, namely the Western Block and Eastern Block; these two blocks amalgamated in the late Palaeoproterozoic at ~1.85 Ga, forming the Trans-North China Orogen (Zhao et al. 2001; 2002; Santosh 2010). The NCC is included in the Nuna supercontinent in a variety of positions; some models have connected the Trans-North China Orogen with other Palaeoproterozoic orogens such as those in India (Zhao et al. 2004, 2006), whereas others have connected the Northern Hebei orogen that forms the northern margin of the NCC with other Palaeoproterozoic orogens (Kusky et al. 2007 GR, Kusky & Santosh 2009; Santosh 2010).

The 1.8-1.4 Ga Xiong'er belt in the southwestern margin of the NCC is interpreted by some to occur in a continental rift environment (Zhao et al. 2002; Peng et al. 2008), whereas others advocate a continental margin setting (Zhao et al. 2003, 2009; He et al. 2008, 2010). The Xiong'er belt is bounded to the south by the 1.6-1.4 Ga Kuanping ophiolite Complex; combining this with the arc setting for the Xiong'er belt, Zhao et al. (2003) suggest that the southern margin of the NCC was bordered by a 1.8-1.3 Ga subduction related belt. If the accretionary margin postulate is accepted, then the NCC must have faced an open ocean along its southwestern margin for this time period; it therefore seems credible to place NCC in the context of a Nuna supercontinent based on this accretionary margin (see Figure 9.8).

The 1.6-1.2 Ga Zhaertai-Bayan Obo rift zone along the northern margin of the NCC is interpreted to result from fragmentation of the NUNA supercontinent (Zhao et al. 2003). A correlation between 1.35 Ga diabase sills in the NCC with 1.4-1.3 Ga mafic dyke swarms in Laurentia, Fennoscandia, Siberia, Australia and Antarctica (Ernst et al. 2008), led Zhang et al. (2009) to infer that the NCC
was part of Nuna until at least this time. Based on extensional magmatism, others consider the NCC to have been involved in break-up of Nuna by 1.6 Ga (Rogers & Santosh 2002).

#### 9.6.2 Proterozoic supercontinents

The 1.8-1.0 Ga long-lived convergent orogen of Karlstrom et al. (2001) can be extended across at least the Amazonia, Fennoscandia, Laurentia, Antarctica, Australia and North China cratons. This accretionary orogen formed on the margin of these continents after the formation of the ~1.8 Ga Nuna supercontinent. Supercontinents may form by two end-member mechanisms: introversion in which interior ocean floor is preferentially subducted, and extroversion in which exterior ocean floor is preferentially subducted (Murphy & Nance 2003). When a supercontinent breaks-up, the trailing edge of dispersing continents will comprise passive margins flanking relatively new oceanic lithosphere, whilst the leading edges will comprise subduction margins that recycle and accrete older mantle lithosphere that surrounded the supercontinent (Murphy et al. 2009).

The Nuna supercontinent partially broke-up at 1.8-1.5 Ga; after this time the continents dispersed before amalgamating again to form the supercontinent Rodinia at ~1.0 Ga. During dispersal, the 1.8-1.3 Ga global accretionary belt can be interpreted in the context of a leading edge, where it recycled the exterior ocean, and accreting oceanic terranes. During retreating phases of this accretionary belt, oceanward migration of the subduction zone trench must have exceeded migration of the continent, allowing for slab rollback. During advancing phases the oceanward migration of the continent would have recycled any oceanbound terranes and lithosphere in an Andean-type setting. The dominance of arc-related 1.8-1.5 Ga crust, and lack of arc-related 1.5-1.1 Ga crust in Fennoscandia, suggests that the margin was dominantly retreating prior to 1.5 Ga, and dominantly advancing after 1.5 Ga.

The idea of the 1.8-1.3 Ga accretionary orogen acting as a leading edge forms the basis of the supercontinent reconstruction shown in Figure 9.8. This reconstruction is largely based on that of Zhao et al. (2002), which was later modified by Zhao et al. (2004) and Hou et al. (2008a). The major change from this previous model is that the global 1.8-1.3 Ga accretionary belt now includes the southwestern margin of the North China Craton, and the southern margin of Australia and its Mawsonland counterpart. The continents are arranged so that the 1.8-1.3 Ga belt forms an exterior belt encircling the supercontinent; this differs from previous reconstructions in which the accretionary belts have only occurred on one side of the supercontinent (e.g. Zhao et al. 2002; Hou et al. 2008; Bispo-Santos et al. 2008). This postulated reconstruction is not constrained by palaeomagnetic data, but does comprise individual fits between continents and some generalised global fits that have been constrained by palaeomagnetism.

During break-up of the Nuna supercontinent after 1.8 Ga, Laurentia and Fennoscandia likely stayed together to at least 1.25 Ga, (Buchan et al. 2000); Amazonia may also have been connected to Fennoscandia until the Sveconorwegian orogeny (Johansson 2009), or may have broken off earlier to then re-amalgamate at ~1.45 Ga (Bogdanova et al. 2001, 2008). Australia may have stayed connected to Laurentia till the formation of Rodinia (Karlstrom et al. 2001). During the formation of Rodinia, the accretionary belt in Laurentia and Baltica then became host to a global-scale interior orogen, the Grenville Belt. To go from an exterior to interior belt, the supercontinent must have extroverted. This is compatible with the postulated rotation of the East European Craton (Starmer 1996), and collision of Amazonia with Laurentia and the EEC (Johansson 2009; Gower et al. 2008; Li et al. 2008).



Figure 9.8. Late Palaeoproterozoic reconstruction of Nuna. Laurentia - Australia - Mawsonland fit modified from Betts et al. (2008); Laurentia - Greenland - East European Craton - Amazon fit modified from Pesonen et al. (2003) and Bispos-Santos et al. (2008); India - N China, Amazon - W Africa - Laurentia - Siberia - Greenland, and S Africa - Australia - Tarim fit modified from Zhao et al. (2002) and Hou et al. (2008a). The location of the S China block is currently unconstrained.

In this model of extroversion of Nuna to form Rodinia, both continental growth and recycling were focussed along the edges of continents as they consumed oceanic lithosphere during their dispersal. Minor amounts of continental growth will have occurred within the interior of the supercontinent during rifting events; some of this rifting is evident as major radiating dyke swarms, i.e. Mackenzie dyke swarm, which has led to inferences about the role of mantle plumes in the break-up of supercontinents (Ernst & Buchan 2002; Hou et al. 2008b).

### 9.7 Continental growth – a final comment

Whitmeyer & Karlstrom (2007) in their model of Proterozoic growth of Laurentia, present a model of continental growth termed the 'arc-accretion-assembly-stabilization' model, which can be applied to accretionary orogens. This model involves three processes; the first comprises accretion of mafic, intermediate and felsic material from the mantle via subduction processes during the multistage evolution of outboard arcs. The second process involves assembly of a mixture of juvenile terranes and older crustal fragments during a series of orogenic episodes, with the style of deformation being subduction-dominated; this multistage assembly includes continental growth via crustal thickening, tectonic imbrications and further differentiation and modification of crust during suturing. The third process involves stabilisation of continental crust via crustal melting, this melting is initiated by crustal thickening and results in periods of late-orogenic granitoid magmatism that stitch sutures and aid the differentiation of the crust.

The arc-accretion-assembly-stabilization model and the processes described above provide a suitable explanation for the formation of Fennoscandian continental crust. The Archaean domains were formed by 2.5 Ga; whether they were formed by subduction-related or geodynamic processes different to those seen today is an interesting topic, but is outside the realm of this thesis. The 2.1-1.8 Ga Svecofennian period saw the multistage assembly of these Archaean domains along with the assembly of arcs and microcontinents at differing stages of maturity. Orogenesis, crustal thickening and orogenic collapse, meant the Palaeoproterozoic and Archaean domains of Fennoscandia were largely stabilised by 1.8 Ga. Further crustal differentiation occurred during repeated episodes of intraplate, commonly A-type, granitoid genesis; these can be related to lithospheric extension associated with distal effects of convergent margin tectonism, and post-orogenic crustal relaxation. After 1.8 Ga the southwest margin of Fennoscandia involved further multistage accretion of largely juvenile crust; this crust was stabilised and differentiated during Sveconorwegian collisional orogenesis (and possibly Hallandian-Danoplonian orogenesis). Since the Sveconorwegian orogeny, the continental crust of Fennoscandia has only seen minor crustal additions such as those in the Oslo Rift (see Larsen et al. 2008), but has suffered major tectonic (as opposed to magmatic) remobilisation of crust along its margins, i.e. during the Caledonian and Timanian orogenies (see Gee et al. 2008).

In Chapter 1, the apparent episodic nature of continental crustal growth was cited, along with the concept that such apparent episodicity may arise from preservational bias in the rock record. This concept suggests that the dominant setting for producing continental crust is at subduction zone margins, but within this setting there is poor potential for preservation; in collisional settings there is little new crust produced, but this setting has a large potential for preservation; and in extensional

settings there is limited zircon-producing crust formed, and this may also have a poor preservational potential (Hawkesworth et al. 2009). Because of this bias, it is likely that periods when collisional settings were most prolific, i.e. when supercontinents amalgamate, will appear to have the greatest amount of crustal growth. The similarity in peaks of crystallisation age with ages of supercontinents (se Figure 1.1), suggests this concept holds true. The peaks in crystallisation age at 1.9 Ga and 2.7 Ga also match up with peaks in juvenile crustal addition, suggesting there was large-scale formation of crust, as well as reworking in collisional settings.

Using Fennoscandia as an example, we can gain some insight in to this important period. During the 2.1-1.8 Ga period, major crustal additions comprised 2.1-2.0 Ga microcontinents with an undefined history, >2.02-1.83 Ga juvenile arcs, and magmatic addition in continental arcs at 1.89 and 1.8 Ga (Lahtinen et al. 2009). There is a lack of 2.5-2.1 Ga age crust, and few detrital zircons have been found within this age range (Lahtinen et al. 2009); suggesting that crustal formation was limited, and that any such crust produced was not preserved. This gap in the 2.5-2.1 Ga period correlates globally (see Figure 1.1). Using the preservation bias concept (Hawkesworth et al. 2009), this period likely involved a lack of collisional orogenies, this in turn can be interpreted as reflecting rifting of the Superia and Slavia cratons (Bleeker 2003). The 1.9 Ga peak in zircon crystallisation ages (and juvenile crustal addition) has previously been linked to a mantle superplume (Condie 2002), but the width of the peak and the existence of a number of individual peaks within the zircon record (Condie et al. 2009), means that a single plume event cannot explain the data. It is suggested that the apparent increase in crustal growth is likely a consequence of both preservation bias during amalgamation of the Nuna supercontinent, but also of increased production of 2.1-1.9 Ga crust via tectonic switching in retreating accretionary orogens that formed just prior to collision. Apparent episodicity of crustal formation is a result of preservational bias that can be linked to formation and break-up of supercontinents on a global scale, but on a regional scale can be linked to episodic migration of subduction zone margins.

Accretionary orogens are the dominant setting for growth and differentiation of continental crust; modern examples can be found in the western Pacific (mainly retreating) and in the eastern Pacific (i.e. Andes; mainly advancing). Ancient examples may have been completely recycled by younger events, however, well-preserved examples exist from a variety of ages (e.g. the 1.8-1.1 Ga belt of SW Fennoscandia and Laurentia, the 1000-325 Ma Central Asian Orogenic Belt, and the 515-330 Ma Tasmanides of eastern Australia); each of these provide a 'tectonic dynasty' for the study of crustal processes (see Åhäll & Larson 2000 and references within).

#### 9.7.1 A final comment on the final comment - continental versus crustal growth

Discussion within this thesis has involved settings, rates and relative amounts of continental growth. It is important to highlight that in the context of this study, continental growth refers to localised addition of juvenile mantle-derived material to the continental crust. Such addition does not imply a net addition to the volume of global continental crust, since at any one time the loss of continental crust globally may outweigh the addition of continental crust. Also, within the context of continental crust, this study has not considered the lithospheric mantle. There is evidence that the sub-continental lithospheric mantle (SCLM) under a large proportion (>70%) of the continental crust is Archaean in age (Begg et al. 2009; Griffin et al. 2009); suggesting that Archaean SCLM has a higher preservation potential than young continental crust. If global crustal growth models account for both the SCLM and the overlying continental crust, the increase in crustal volume since the Archaean will be near zero (Begg et al. 2009).

# Appendix

## **XRF** methodology and precision

Samples were prepared for XRF analysis by removing their weathered surfaces, broken up using a mechanical jaw-splitter, crushed to a coarse powder using an engineer's fly press, and milled to a fine powder in agate pots. At the University of Leicester samples were analysed on a Philips PW1400 X-ray fluorescence spectrometer (sample numbers SA3-XX) or a PANalytical Axios Advanced XRF spectrometer (sample numbers SA7-XX and SA8-XX). There was no significant difference between results from the two instruments.

Loss on ignition was determined from powders dried overnight at 105°C, then ignited at 950°C for 1 hour. Major elements were determined on fused glass beads prepared from ignited powders, with a sample to flux ratio of 1:5, 80% Li metaborate: 20% Li tetraborate flux; the results are quoted as component oxide weight percent, re-calculated to include LOI. Trace elements were analysed on 32mm diameter pressed powder briquettes, prepared from 10g fine ground powder mixed with ~20-25 drops 7% PVA solution and pressed at 10 tons per square inch.

Components with concentrations below the lower limit of detection reported as bdl. LLDs calculated from  $3-\sigma$  for the background determination. At the Norwegian Geological Survey, samples (sample numbers MMxxxxxx and ROGxxx) were analysed on a PANalytical Axios Advanced XRF spectrometer using methods similar to those above, and on a Finnigan MAT ICP-MS (Y, Zr, Nb, REE, Ta, Hf, Th and U), see Flem et al. (2005) for full description of the methods.

Table 10	).1 A	verage	pre	cision a	and lo	wer limits	of detec	tion	(LL	LD) bas	sed on re	peat	analy	ses of	CRMs,	major
element	data	from	the	Norweg	gian (	Geological	Survey	has	a s	similar	precision	1 to	those	from	Univers	sity of
Leiceste	r.															

	Precision	LLD		Precisi	on (UoL)	LLD		Precisio	on (NGU)
	2σ %			@ >15ppm	@ <15ppm			@ <50ppm	@ >50ppm
SiO <sub>2</sub>	1.2	0.015		2σ %	2σ (ppm)			2σ %	2σ %
TiO <sub>2</sub>	3.2	0.002	Cr	5.5	5.0	0.7	Cr	<10	<5
$AI_2O_3$	1.9	0.008	Ni	1.4	4.3	0.6	Ni	<10	<5
Fe <sub>2</sub> O <sub>3</sub>	1.4	0.001	v	1.4	12.3	0.8	v	<10	<5
MnO	6.0	0.001	Co	6.3	7.4	0.8	Со	<10	<5
MgO	3.8	0.048	Sc	22.9	12.0	0.9	Sc	<20	<10
CaO	6.3	0.001	Zn	2.0		0.7	Zn	<10	<5
Na₂O	6.3	0.014	Ga	6.5		0.4	Ga	<10	<5
K <sub>2</sub> O	11.0	0.002	Zr	4.5		0.2	Zr	<20	<10
P <sub>2</sub> O <sub>5</sub>	8.3	0.001	Nb	1.9	5.1	0.2	Nb	<10	<5
			Th	4.7	4.3	0.4	Th	<10	<5
			U	3.0	11.3	0.4	U	<10	<5
			Pb	6.8	4.6	0.5	Pb	<10	<5
			Sr	0.7	1.1	0.2	Sr	<10	<5
			Rb	4.4	4.0	0.2	Rb	<10	<5
			Ba	6.3	10.0	2.9	Ва	<20	<10
			Cs		6.4	1.4	Cs	<50	<25
			La	8.0	9.9	1.7	La	<20	<10
			Ce	8.1	19.5	6.6	Ce	<30	<15
			Nd	7.9	13.6	2.4	Nd	<20	<10
			Y	5.8	0.7	0.2	Y	<10	<5

0	1414 000000	1414 000707	MM 000747	1414 000700	1414 000704	1111000700
Sample	MIN 036632	MIN 036707	IVIN 036717	MM 036720	MIM 036724	MIM 036730
UTM x	348322	347157	354445	354919	355941	347641
UTM y	6616123	6603168	6604423	6604757	6604923	6613373
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Granitoid	Granitoid	Granitoid	Granitoid	Granitoid	Granitoid
Lithology	Deformed grey porphyritic biotite- hornblende granitoid	Deformed porphyritic biotite- granite	Deformed dark grey fine- porphyritic granitoid	Deformed dark grey porphyritic biotite-granitoid	Deformed dark grey porphyritic biotite-granitoidd	Weakly deformed grey porphyritic biotite- hornblende granitoid
Mineralogy		Ksp, Pl, Qz, Ep, Bt, Acc- Opq, Tt	Qz, Ksp, Pl, Bt, Ep	Qz, Ksp, Pl, Bt, Ep + Opq		
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section		x	x	x		
Other						

Sample	ROG396	ROG400	ROG401	ROG402	ROG413	ROG416
UTM x	344634	344093	344067	344078	350990	347437
UTM y	6595471	6594399	6593551	6593803	6593628	6593415
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Granitoid	Granitoid	Granitoid	Granitoid	Granitoid	Granitoid
Lithology	Porphyritic granitoid	Porphyritic granitoid	Porphyritic granitoid	Porphyritic granitoid	Coarse-grained porphyritic granite	Porphyritic granitoid
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other						

Sample	MM 026153	MM 026173	MM 036672	MM 036673	MM 036676	MM 036677
UTM x	343454	338888	352723	353796	356627	354078
UTM y	6592899	6591831	6595827	6596944	6595116	6593768
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
Lithology	Deformed fine- grained amphibolite	Deformed massive amphibolite	Undeformed metagabbro	Weakly deformed hornblende quartz-diorite	Coarse-grained hornblende- granite	Deformed dark grey hornblende- quartz-diorite
Mineralogy					K-sp + Plag + Qtz + Amph (act) + Opq + Ep + acc tit	
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section					x	
Other					U-Pb-NS,Hf-O	

Sample	MM 036681	MM 036682	MM 036686	MM 036692	MM 036693	MM 036694
UTM x	345295	344831	345144	345953	345932	346424
UTM y	6603186	6603219	6604380	6606022	6606001	6606658
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
Lithology	Undeformed medium-grained metadiorite	Metadiorite, scattered feldpspar phenocrysts	Weakly deformed black amphibolite	Fine-grained black amphibolite	Fine-grained black amphibolite	Weakly deformed med grained porphyritic gabbro
Mineralogy	Pl, Amph, Qz, Bt, Opq, Chl - Acc - Ap, Ep					Pl, Bt, Qz, Tt, Acc - Opq, Ap, Ep
Geochem	x	х	x	x	x	x
REE	x	x	x	x	x	x
Thin section	x					x
Other						

Sample	MM 036695	MM 036698	MM 036699	MM 036711	MM 036712	MM 036713
UTM x	346319	346039	346015	350822	351583	353018
UTM y	6606505	6606404	6606353	6603975	6603907	6603991
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
Lithology	Deformed coarse- grained porphyritic gabbro	Deformed fine- grained massive amphibolite	Deformed fine- grained massive amphibolite	Undeformed porphyritic hornblende- biotite granodiorite	Undeformed porphyritic hornblende- biotite granodiorite	Weakly deformed porphyritic hornblende granitoid
Mineralogy	PI + Bt + Qz + Tt + Acc - Opq + Ap + Ep			PI + Qz + Ksp + Bt + Amph + Acc - Opq + Tt + Ap	PI + Qz + Ksp + Bt + Amph + Acc - Opq + Tt + Ap	PI + Ksp + Qz + Amph + Bt + Acc - Opq + Tt + Ap
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section	x			x	x	x
Other						

Sample	ROG394	ROG421	ROG399	ROG525	MM 2235	MM 2241
UTM x	345803	354199	344289	356618	348106	349390
UTM y	6595821	6595345	6594908	6595498	6570396	6578545
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Grey Gneiss	Grey Gneiss
Lithology	Amphibolite	Amphibolite	Amphibolite	Medium-grained hornblende gabbro	Banded fine- grained grey biotite gneiss	Banded fine- grained grey biotite gneiss
Mineralogy				PI + Amph + Qz + Ksp + Ep + ChI + Opq	Qz + Pl + Ksp + Bt + Chl + Acc - Opq + Ap	Qz + Pl + Ksp + Bt + Chl + Acc - Opq + Ap
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section				x	x	x
Other				U-Pb-NS,Hf-O	U-Pb-NS,Hf-O	U-Pb-NS,Hf-O

1	1					
Sample	MM 026152	MM 026157	MM 026160	MM 026161	MM 026166	MM 026170
UTM x	343401	344535	336908	336803	339975	339629
UTM y	6592974	6595278	6587700	6587753	6593759	6593023
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed grey gneiss, diffusely porphyritic	Massive dark grey fine-grained grey gneiss	Grey biotite gneiss, med grained, diffusely banded	Grey biotite gneiss, med grained, diffusely banded	Weakly deformed porphyritic diorite	Deformed dark grey diorite with hornblende spots
Mineralogy	Pl + Qz + Ksp + Bt + Amph + Acc - Opq + Ep + Ap					
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section	x					
Other						

Sample	MM 026171	MM 026181	MM 026263	MM 026265	MM 036575	MM 036576
UTM x	339456	338373	351926	352436	345495	343349
UTM y	6592844	6588018	6600846	6600597	6596435	6592617
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed fine- grained grey biotite-gneiss	Fine-grained diffusely banded biotite-gneiss	Fine-grained dark grey porphyritic gneiss	Fine-grained dark grey porphyritic gneiss	Deformed fine- grained dark grey porphyritic gneiss	Deformed fine- grained dark grey porphyritic gneiss
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other						

Sample	MM 036577	MM 036591	MM 036594	MM 036595	MM 036600	MM 036601
UTM x	344087	334955	334829	334497	333330	334950
UTM y	6594373	6590672	6590472	6590203	6590247	6590560
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed fine- grained dark grey porphyritic gneiss	Deformed fine- grained grey porphyritic gneiss	Deformed fine- grained dark grey gneiss			
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other						

Sample	MM 036631	MM 036671	MM 036674	MM 036675	MM 036678	MM 036683
UTM x	348858	351638	352446	352254	359462	345258
UTM y	6616037	6595280	6594152	6594065	6596440	6604120
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed light grey fine-grained gneiss	Undeformed porphyritic metadiorite	Massive hornblende quartz-diorite	Deformed fine- grained dark grey porphyritic gneiss	Deformed fine- grained dark grey biotite gneiss	Undeformed coarse-grained hornblende- biotite granitoid
Mineralogy	PI + Qz + Ksp + Ms + Bt + Acc - Opq					Qz + PI + Ksp + Bt + Amph + Ep + Acc - Tt
Geochem		х	x	x	x	x
REE	x	x	x	x	x	x
Thin section	x					x
Other	U-Pb-NS, Hf-O					

Sample	MM 036688	MM 036690	MM 036700	MM 036701	MM 036702	MM 036704
UTM x	345444	345613	346799	347079	346991	347497
UTM y	6605437	6605587	6606932	6607172	6606998	6608282
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Fine-grained massive dark grey gneiss	Fine-grained massive dark grey gneiss	Massive fine- grained biotite- hornblende grey gneiss	Massive fine- grained biotite- hornblende grey gneiss	Massive fine- grained biotite- hornblende grey gneiss	Fine-grained grey gneiss with quartz lamellae
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other						

Sample	MM 036706	MM 036710	MM 036680	MM 036714	MM 036715	MM 036716
UTM x	346743	348284	359804	354244	353728	353779
UTM y	6607670	6602040	6597146	6604274	6604119	6604134
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed greenish grey massive quartz- diorite	Deformed medium-grained porphyritic grey granodiorite	Fine-grained light grey gneiss	Fine-grained grey gneiss	Medium-grained hornblende diorite	Medium-grained hornblende diorite
Mineralogy	PI + Amph + Qz + Ksp + Acc - Ep	PI + Qz + Bt + Ksp + Acc - Ep				
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section	x	x				
Other						

Sample	MM 036721	MM 036722	MM 036725	MM 036726	MM 036727	MM 036728
UTM x	355193	355280	355427	356619	356461	356309
UTM y	6604831	6604847	6604887	6604998	6604978	6604825
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Fine-grained massive dark grey gneiss	Fine-grained massive dark grey gneiss with hornblende	Fine-grained massive dark grey gneiss	Deformed light grey scattered porphyritic grey gneiss	Deformed dark grey small porphyritic metadiorite	Deformed light grey scattered porphyritic gneiss
Mineralogy				Qz + PI + Ksp + Bt + Amph + Tt + Acc - Ep	PI + Amph + Ksp + Qz + Tt + ChI + Acc - Ep	PI + Amph + Ksp + Qz + Bt + Tt + ChI + Acc - Ep
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section				x	x	x
Other						

Sample	Ro-102B	ROG339-1	ROG339-2	ROG340	ROG369	ROG393
UTM x	344250	357733	357733	357601	344901	345891
UTM y	6510480	6597315	6597315	6597216	6594801	6595966
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed grey migmatitic gneiss	Deformed fine- grained grey gneiss	Deformed fine- grained grey gneiss	Deformed medium-grained grey gneiss	Deformed medium-grained porphyritic grey gneiss	Deformed fine- grained porphyritic grey gneiss
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other	U-Pb-NGU,Hf					

Sample	ROG395	ROG397	ROG398	ROG403	ROG404	ROG405
UTM x	345145	344576	344306	343761	343312	342955
UTM y	6595826	6595353	6594918	6593317	6592601	6591765
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss					
Lithology	Deformed fine- grained grey gneiss					
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other						

Sample	ROG406	ROG407	ROG408	ROG409	ROG410	ROG411
UTM x	342735	342453	342330	342124	347762	348534
UTM y	6591576	6590679	6590245	6589555	6595136	6594400
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss					
Lithology	Deformed fine- grained grey gneiss					
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other						

Sample	SA7-80	SA7-91	SA7-92	SA7-128	SA7-129	SA7-133
UTM x	348988	338383	359281	353598	352845	361341
UTM y	6603505	6627090	6642829	6604075	6604012	6599002
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Granitoid	Granitoid	Granitoid	Granitoid	Granitoid	Granitoid
Lithology	Weakly deformed coarse-graine biotite-hornblende granite	Undeformed medium grained biotite granite	Deformed medium-grained biotite granite	Undeformed coarse-grained porphyritic granodiorite	Undeformed coarse-grained porphyritic granite	Undeformed coarse-grained porphyritic granite
Mineralogy		Qz + Ksp + Pl + Bt + Ep + Acc - Opq + Ap	Qz + Ksp + Pl + Bt + Ep + Acc - Opq + Ap		Ksp + Qz + Pl + Bt + Amph + Acc - Opq + Ap + Ep	
Geochem	x	x	x	x	x	x
REE						
Thin section			x		x	
Other		U-Pb-NIGL,Hf-O				

Sample	SA8-016	SA7-123	SA7-124	SA3-02	SA3-49	SA7-38
UTM x	356709	353964	353964	347387	345238	346143
UTM y	6640857	6604111	6604110	6607361	6603123	6606454
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Granitoid	Hybrid	Hybrid	Amphibolite	Amphibolite	Amphibolite
Lithology	Undeformed coarse-grained grey granite	Fine-grained dark grey gneiss	Fine-grained grey gneiss	Undeformed coarse-grained tonalite	Weakly deformed coarse-grained porphyritic gabbro	Weakly deformed massive medium- grained diorite
Mineralogy				PI + Q + Amph + Bt + ChI + Ep + Opq + Acc - Ap	Amph + PI + Qz + Bt + ChI + Ksp + Opq	
Geochem	x	x	x	x	x	x
REE						
Thin section				x	x	
Other				U-Pb-TIMS		

Sample	SA7-79	SA7-86	SA7-104	SA7-111	SA7-112	SA7-114
UTM x	345227	345526	343753	357352	357352	357352
UTM y	6605324	6603195	6601103	6605321	6605321	6605321
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
Lithology	Deformed felsic part of veined gabbro	Pegmatitic zone of hornblende gabbro	Deformed fine- grained dark grey gneissic enclave	Deformed fine- grained black amphibolite	Deformed fine- grained black amphibolite	Deformed fine- grained black amphibolite with felsic segregations
Mineralogy		Amph + PI + Tt + Acc - Ap + Qz				
Geochem	x	x	x	x	x	x
REE						
Thin section		x				
Other		U-Pb-TIMS,Hf-O				

Sample	SA7-131	SA7-132	SA3-04	SA3-08	SA3-23	SA3-42
UTM x	359893	359892	340220	361603	349912	336568
UTM y	6596991	6596990	6593772	6598858	6604108	6591640
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Amphibolite	Amphibolite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed fine- grained black amphibolite	Deformed fine- grained black amphibolite	Deformed coarse- grained porphyritic granodiorite	Undeformed medium-grained granodiorite	Weakly deformed coarse-grained granodiorite	Deformed fine- grained felsic grey gneiss
Mineralogy	Amph + PI + Bt + Qz + Ksp + Acc + Tt + Opg		PI + Qz + Ksp + Bt + Tt + Acc- Ap	PI + Amph + Bt + Ep + Qz + Ksp + Tt + Acc - Opg	PI + Qz + Ksp + Bt + Acc - Opq + Tt + Ap	Qz + PI + Ksp + Bt + Chl
Geochem	x	x	x	x	x	x
REE						
Thin section	x		x	x	x	x
Other			U-Pb-NIGL,Hf-O			

Sample	SA3-46	SA3-51	SA3-52	SA3-60	SA7-43	SA7-47
UTM x	341723	345602	346944	345387	345920	345475
UTM y	6598875	6605605	6607002	6605374	6606001	6605499
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed medium-grained intermediate grey gneiss	Deformed medium-grained hornblende- bearing grey gneiss	Deformed medium-grained intermediate grey gneiss	Deformed banded felsic grey gneiss	Deformed banded felsic grey gneiss	Deformed banded felsic grey gneiss
Mineralogy	PI + Qtz + Amph + Bt + Ksp + Acc - Tt + Opq + Ap	PI + Amph + Qz + Bt + Chl	Qz + PI + Ksp + Bt + Acc - Opq	PI + Qz + Ksp + Bt + Acc - Tt + Opq + Grt		
Geochem	x	x	x	x	x	x
REE						
Thin section	x	x	x	x		
Other				U-Pb-NIGL,Hf-O		

Sample	SA7-61	SA7-77	SA7-82	SA7-84	SA7-85	SA7-101
UTM x	365167	345598	341789	341721	341511	344525
UTM y	6599387	6605586	6599190	6598858	6597713	6602581
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed fine- grained felsic aphyric grey gneiss	Deformed medium-grained hornblende- bearing grey gneiss	Weakly deformed coarse- grained granodiorite	Deformed fine- grained felsic grey gneiss	Deformed medium-grained grey gneiss, sparsely feldspar- phyric	Weakly deformed coarse- grained granodiorite
Mineralogy		PI + Amph + Bt + ChI + Qz + Ksp + Ep				
Geochem	x	x	x	x	x	x
REE						
Thin section		x				
Other						

Sample	SA7-103	SA7-105	SA7-106	SA7-107	SA7-113	SA7-115
UTM x	343752	341998	341576	341576	357352	357232
UTM y	6601105	6600110	6598030	6598030	6605321	6605241
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed fine- grained felsic grey gneiss	Weakly deformed coarse- grained granodiorite	Deformed felsic gneissic enclave	Deformed medium-grained grey gneiss, sparsely feldspar- phyric	Deformed medium-grained granodiorite	Deformed medium-grained granodiorite
Mineralogy						PI + Amph + Qz + Ksp + Bt + Chl
Geochem	x	x	x	x	x	x
REE						
Thin section						x
Other						

Sample	SA7-119	SA7-125	SA7-130	SA7-134	SA8-56	SA8-57
UTM x	356737	353964	359894	357715	374291	374291
UTM y	6605029	6604112	6596991	6597286	6610312	6610312
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
Lithology	Deformed fine- grained felsic grey gneiss	Undeformed medium-grained granodiorite	Deformed banded felsic grey gneiss	Deformed banded felsic grey gneiss	Undeformed coarse-grained porphyritic aranodiorite	Deformed fine- grained dark grey gneiss
Mineralogy				Qz + Pl + Ksp + Bt + Amph + Opq		
Geochem	x	x	x	x	x	x
REE						
Thin section				x		
Other			U-Pb-TIMS,HF-O			

Sample	SA8-64	SA8-65	SA3-62	SA3-63	SA3-66	SA3-67
UTM x	361852	361852	351175	357478	355182	351678
UTM y	6598854	6598854	6613340	6615601	6616561	6614399
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Grey Gneiss	Grey Gneiss	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite
Lithology	Deformed fine- grained light grey gneiss	Deformed medium-grained porphyritic grey gneiss	Deformed medium-grained banded grey gneiss	Deformed medium-grained light grey gneiss	Deformed medium-grained light grey gneiss	Deformed medium-grained light grey gneiss
Mineralogy			Qz + Ksp + PI + Acc + Bt + Ep + Tt + Opq	Qz + PI + Ksp + Bt + Acc - Opq + Grt + Ep	Qz + PI + Ksp + Bt + Amph + Acc - Tt + Opg	Qz + PI + Ksp + Bt + Acc - Grt + Opq + Ep
Geochem	x	x	x	x	x	x
REE						
Thin section			x	x	x	x
Other						

Sample	SA7-04	SA7-05	SA7-11	SA7-12	SA7-14	SA7-16
UTM x	357114	357489	356816	356817	356692	356522
UTM y	6615430	6615470	6615678	6615678	6615513	6615595
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite
Lithology	Deformed medium-grained light grey biotite gneiss	Deformed coarse- grained porphyritic granodiorite	Deformed fine- grained dark grey gneiss	Deformed medium-grained Igrey biotite gneiss	Deformed fine- grained dark grey gneiss	Deformed medium-grained porphyritic granodiorite
Mineralogy	PI + Qz + Ksp + Bt	PI + Qz + Ksp + Bt + Amph + Acc - Opq			Amph + Pl + Qz + Bt + Ksp + Opq	
Geochem	x	x	x	x	x	x
REE						
Thin section		x			x	
Other	U-Pb-TIMS,Hf-O					

SA7-18	SA7-19	SA7-20	SA7-21	SA7-22	SA7-23
356274	356274	356274	356274	356274	356170
6615648	6615648	6615648	6615648	6615648	6615549
Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite
Deformed fine- grained dark grey gneiss	Deformed medium-grained felsic vein/band	Deformed medium-grained grey banded biotite gneiss	Deformed fine grained felsic vein/band	Deformed fine- grained felsic vein/band	Deformed medium-grained porphyritic grey gneiss
Qz + PI + Ksp + Bt + Ms + Ep + Acc - Tt					Qz + Pl + Ksp + Bt + Acc - Ep + Tt + Opq
x	x	x	x	x	x
x					x
	SA7-18 356274 6615648 Telemarkian Zinc Mine Suite Deformed fine- grained dark grey gneiss Qz + Pl + Ksp + Bt + Ms + Ep + Acc - Tt x x	SA7-18 SA7-19   356274 356274   6615648 6615648   Telemarkian Telemarkian   Zinc Mine Suite Zinc Mine Suite   Deformed fine- grained dark grey gneiss Deformed medium-grained felsic vein/band   Qz + Pl + Ksp + Bt + Ms + Ep + Acc - Tt X   X X   X X   X Image: Second S	SA7-18 SA7-19 SA7-20   356274 356274 356274   6615648 6615648 6615648   Telemarkian Telemarkian Telemarkian   Zinc Mine Suite Zinc Mine Suite Zinc Mine Suite   Deformed fine- grained dark grey gneiss Deformed medium-grained felsic vein/band Deformed medium-grained grey banded biotite gneiss   Qz + PI + Ksp + Bt + Ms + Ep + Acc - Tt X X X   X X X X   X Image: Solution of the second s	SA7-18 SA7-19 SA7-20 SA7-21   356274 356274 356274 356274   6615648 6615648 6615648 6615648   Telemarkian Telemarkian Telemarkian Telemarkian   Zinc Mine Suite Zinc Mine Suite Zinc Mine Suite Zinc Mine Suite   Deformed fine- grained dark greg gneiss Deformed medium-grained felsic vein/band Deformed gray banded biotite gneiss Deformed fine grained felsic vein/band   Qz + Pl + Ksp + Bt + Ms + Ep + Acc - Tt X X X   X X X X   X X X X   X Image: Second fine sec	SA7-18 SA7-19 SA7-20 SA7-21 SA7-22   356274 356274 356274 356274 356274   6615648 6615648 6615648 6615648 6615648   Telemarkian Telemarkian Telemarkian Telemarkian Telemarkian   Zinc Mine Suite   Deformed fine- grained dark grey gneiss Deformed medium-grained felsic vein/band Deformed medium-grained grey banded biotite gneiss Deformed fine- grained felsic vein/band Deformed fine- grained felsic vein/band   Qz + Pl + Ksp + Bt + Ms + Ep + Acc- Tt X X X X   X X X X X   X X X X X   X X X X X X

Sample	SA7-24	SA7-27	SA7-109	SA7-136	SA7-138	SA7-140
UTM x	355610	354987	347446	350880	350808	354658
UTM y	6616321	6616753	6608199	6617983	6618582	6616673
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Telemarkian
Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite
Lithology	Deformed medium-grained porphyritic grey gneiss	Deformed fine- grained grey gneiss	Deformed fine- grained banded light grey gneiss	Deformed fine- grained banded light grey gneiss	Deformed medium-grained grey gneiss	Deformed fine- grained light grey gneiss
Mineralogy	Qz + PI + Ksp + Bt + Acc - Ep + Tt + Ap	Qz + PI + Ksp + Bt + Acc - Ep + ap		PI + Amph + Ep + ChI + Acc - Qz + Opq + Tt	PI + Qz + Amph + Ksp + Ep + Acc - Opg	
Geochem	x	x	x	x	x	x
REE						
Thin section	x	x		x	x	
Other						

Sample	SA7-141	SA7-142	SA7-143	SA8-45	SA3-01a	SA3-01b
UTM x	354686	354876	354819	376752	357948	357948
UTM y	6616754	6616569	6616681	6613070	6615161	6615161
Age	Telemarkian	Telemarkian	Telemarkian	Telemarkian	Sveconorwegian	Sveconorwegian
Suite	Zinc Mine Suite	Zinc Mine Suite	Zinc Mine Suite	Nesflaten	HBG	HBG
Lithology	Deformed fine- grained banded light grey gneiss	Deformed fine- grained grey gneiss	Deformed porphyritic medium-grained grey gneiss	Deformed medium-grained banded biotite- gneiss	Undeformed coarse-grained porphyritic bioitite granite	Undeformed coarse-grained porphyritic bioitite granite
Mineralogy					Ksp + PI + Qz + Bt + Tt + Acc - Ap	Ksp + PI + Qz + Bt + Tt + Acc - Ap
Geochem	x	x	x		x	x
REE						
Thin section					x	x
Other				U-Pb-NIGL	U-Pb-NIGL,Hf-O	

Sample	SA7-58	SA7-65	SA8-50	SA8-51	SA8-52	SA8-54
UTM x	359965	375658	358960	365238	373897	373298
UTM y	6596954	6626611	6616661	6623402	6629309	6619421
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian
Suite	Suite	HBG	HBG	HBG	HBG	HBG
Lithology	Undeformed coarse-grained porphyritic granite	Undeformed coarse-grained porphyritic bioitite granite	Undeformed coarse-grained porphyritic bioitite granite with pink feldspar	Undeformed fine- grained granite	Undeformed coarse-grained porphyritic bioitite granite	Undeformed coarse-grained white granite
Mineralogy						
Geochem		x	x	x	x	x
REE						
Thin section						
Other	U-Pb-TIMS					

Sample	MM 02277	MM 026183	MM 026226	ROG 190	ROG 197	ROG 200
UTM x	325424	375014	315203	324908	327033	327378
UTM y	6526915	6615718	6613355	6517359	6518349	6518699
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian
Suite	HBG	HBG	HBG	HBG	HBG	HBG
Lithology	Massive medium- grained leucocratic granite	Undeformed coarse-grained white biotite- granite	Massive granite	Garnet-granite, associated with pelite	Undeformed medium-grained garnet-granite	Deformed garnet- granite
Mineralogy	Ksp + Qz + PI + Bt + Grt + ChI + Acc - Ap + Opg		Qz + Ksp + PI + Bt + ChI + Acc - Ap + Opq			
Geochem	x	x		х	x	х
REE	x	x		x	x	x
Thin section	x		x			
Other	U-Pb-NS,Hf		U-Pb-NS,Hf			

Sample	ROG 203	ROG 245	ROG 275	ROG 641	MM 02105	MM 02214
UTM x	327858	316703	318862	330123	332637	333807
UTM y	6519377	6531446	6531428	6508272	6585303	6539047
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian
Suite	HBG	HBG	HBG	HBG	Feda	Feda
Lithology	Foliated garnet- granite	Weakly deformed medium-grained garnet-granite	Garnet-granite	Granite associated with Faurefjell metaseds	Deformed porphyritic granodiorite	Deformed coarse- grained porphyritic biotite-granite
Mineralogy						
Geochem	x	x	x		x	x
REE	x	x	x		x	x
Thin section						
Other			U-Pb-NS, Hf	U-Pb-NS,Hf-O		

Sample	MM 02247	MM 026182	MM 026199	MM 026255	MM 026302	MM 026303
UTM x	338597	335158	364670	334332	342702	344910
UTM y	6572694	6587408	6544077	6560297	6570573	6570265
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian
Suite	Feda	Feda	Feda	Feda	Feda	Feda
Lithology	Deformed grey porphyritic biotite- hornblende granite	Weakly deformed porphyritic granodiorite	Weakly deformed grey porphyritic granite	Deformed porphyritic biotite- granite	Porphyritic granite	Porphyritic granite
Mineralogy	Ksp + Qz + Plg + Bt + Tt + Opq + Acc - Ep + Ap	Ksp + Qz + Pl + Bt + Tt + Acc - Opq + Ep + Ap			Ksp + Qz + Pl + Bt + Chl + Acc -Opq + Ap	
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section	x	x			x	
Other	U-Pb-NS,Hf-O				U-Pb-NS,Hf-O	

Sample	MM 026306	MM 99208	ROG 13-1	ROG 15	ROG 16	ROG 218
UTM x	340075	359185	362877	363301	363845	314258
UTM y	6579722	6480785	6558911	6558756	6558173	6532437
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian
Suite	Feda	Feda	Feda	Feda	Feda	Feda
Lithology	Undeformed porphyritic granite	Porphyritic granitoid	Deformed porphyritic granitoid	Deformed porphyritic granitoid	Deformed porphyritic granitoid	Porphyritic granite, large zrn sep. sample
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	x	x	x	x	x
Thin section						
Other	U-Pb-NS,Hf-O					U-Pb-NS,Hf

Sample	ROG 23	ROG 256	ROG 257	ROG 27	ROG 2A	ROG 34
UTM x	364079	355088	355185	363949	378768	363661
UTM y	6557117 6586267 658528		6585284	6556165	6544483	6553510
Age	Sveconorwegian	Sveconorwegian	econorwegian Sveconorwegian Sveconorwegia		Sveconorwegian	Sveconorwegian
Suite	Feda	Feda	Feda	Feda	Feda	Feda
Lithology	Deformed porphyritic granitoid	Deformed porphyritic granitoid	Deformed porphyritic granitoid	Deformed porphyritic granitoid with red feldspar	Deformed porphyritic granitoid	Deformed porphyritic granitoid with red feldspar
Mineralogy						
Geochem	x	x	x	x	x	x
REE	x	х	x	x	x	x
Thin section						
Other						

Sample	ROG 43	ROG 71	ROG 72	ROG 75	ROG 80	ROG329
UTM x	366261	373508	376216	380509	371806	327835
UTM y	6549586	6546690	6546418	6541581	6546058	6540728
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian
Suite	Feda	Feda	Feda Feda		Feda	Feda
Lithology	Deformed porphyritic granitoid with red feldspar	Deformed Deformed Deformed porphyritic porphyritic granitoid granitoid granitoid		Deformed porphyritic granitoid	Deformed porphyritic granitoid	Deformed porphyritic granitoid
Mineralogy						
Geochem	x	x	x	x	x	x
REE	REE X		x	x	x	x
Thin section						
Other					U-Pb-NS,Hf-O	

Sample	MM 02230	MM 026191	MM 026297	MM 026298	MM 026299	ROG 28
UTM x	350409	362621	361312	361046	360948	363525
UTM y	6554133	6549102	6548784	6548791	6549097	6555933
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian	Sveconorwegian
Suite	Leucogranite	Leucogranite	Leucogranite	Leucogranite	Leucogranite	Leucogranite
Lithology	Massive medium- grained light grey biotite granite	Coarse-grained leucocratic granite	Leucocratic granite	Leucocratic granite	Leucocratic granite	Undeformed medium-grained leucocratic granite
Mineralogy	Ksp + Qz + Pl + Bt + Acc - Opq + Ap	Qz + Pl + Ksp + Bt + Chl + Acc - Opq + Ap	Ksp + Qz + Pl + Bt + Chl + Tt + Opg + Acc -Ap			
Geochem		x	x	x	x	x
REE		x	x	x	x	x
Thin section	x	x	x			
Other	U-Pb-NS,Hf		U-Pb-NS,Hf			

Sample	ROG 30-1	ROG 33	ROG 45	SA8-19	SA8-23a	SA8-23b
UTM x	364734	364407	366293	353350	372344	372344
UTM y	6551294	6552651	6549215	6609080	6636570	6636570
Age	Sveconorwegian	Sveconorwegian	Sveconorwegian	econorwegian Caledonian Caledonian		Caledonian
Suite	Leucogranite	Leucogranite	Leucogranite	Storhei	Dyrskard	Dyrskard
Lithology	Undeformed medium-grained leucocratic granite	Leucogranite	Leucogranite	Deformed coarse grained granitoid	Deformed fine- grained light grey gneiss	Deformed fine- grained light grey gneiss
Mineralogy				PL + Qz + Ksp + Bt + Amph + Opq + Acc - Ap + Ep	Qz + Pl + Ksp + Bt + Opq + Acc - Ep	Qz + Pl + Ksp + Bt + Opq + Acc - Ep
Geochem	x	x	x		x	x
REE	x	x	x			
Thin section				x	x	x
Other				U-Pb-NIGL,Hf	U-Pb-NIGL,Hf	

Sample	SA8-26	SA8-27	SA8-32	Table 10.2. Sample details. Co-ordinates
UTM x	372625	372960	351794	are UTM zone $32V$ Pl = Plagioclase Oz
UTM y	6636194	6635575	6599124	- Ouartz Ksp $-$ K-feldspar Amph $-$
Age	Caledonian	Caledonian	Caledonian	$\Delta$ mphibole Bt – Biotite An – Apatite
Suite	Kvitenut	Revsegg	Holmasjø	$E_{p} = E_{pidote}$ $C_{bl} = C_{blorite}$ $M_{s} = C_{blorite}$
Lithology	Deformed mylonitic banded grey gneiss Qz + PI + Ksp +	Deformed biotite- musovite quartz- feldspar gneiss Qz + Pl + Ksp +	Deformed grey gneiss	Muscovite, Grt = Garnet, Opq = Opaques. In other- U-Pb-NIGL = dated by LA-ICP-MS at NIGL, U-Pb-TIMS = dated by TIMS and LA-ICP-MS at NIGL, U-Pb- NS = dated by jonprobe at
Mineralogy	Bt + Ms + Grt + Ep + Acc - Opq	Ms + Bt + Grt + Ep + Acc - Opq		Nordsim, U-Pb-NGU = dated by LA-ICP
Geochem				MS at NGU, $Hf = in-situ$ hafnium
REE				analyses by LA-ICP-MS at NIGL, $O =$
Thin section	x	x		oxygen isotope analysis by ionprobe at
Other	U-Pb-NIGL,Hf	U-Pb-NIGL,Hf	U-Pb-NIGL,Hf	Edinburgh.

Sample	MM 036632	MM 036707	MM 036717	MM 036720	MM 036724	MM 036730	ROG396	ROG400	ROG401	ROG402	ROG413
UTM x	348322	347157	354445	354919	355941	347641	344634	344093	344067	344078	350990
UTM y	6616123	6603168	6604423	6604757	6604923	6613373	6595471	6594399	6593551	6593803	6593628
Suite	Granitoid										
SiO2	72.20	69.80	72.80	72.80	73.70	71.40	74.10	73.50	73.80	72.90	69.50
AI2O3	12.90	14.40	13.40	13.70	13.30	14.00	13.10	13.10	13.00	13.00	13.50
Fe2O3	2.62	3.39	2.83	2.22	2.75	2.57	1.75	2.87	2.42	3.26	3.84
TiO2	0.29	0.44	0.26	0.21	0.33	0.26	0.12	0.25	0.22	0.30	0.60
MgO	0.36	0.66	0.39	0.28	0.47	0.36	0.09	0.19	0.22	0.38	0.66
CaO	1.65	2.32	1.28	1.20	1.56	1.54	1.50	1.29	1.30	1.60	1.38
Na2O	3.00	3.08	4.53	3.49	2.97	3.51	3.58	2.89	2.99	3.00	3.03
K2O	4.81	4.25	2.91	4.59	4.68	4.43	4.56	5.34	5.01	4.60	5.09
MnO	0.03	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.03	0.05	0.06
P2O5	0.07	0.12	0.06	0.04	0.08	0.06	0.03	0.04	0.04	0.06	0.22
LOI	0.71	1.26	0.61	0.75	0.57	0.76	0.72	0.30	0.39	0.39	0.66
Total	98.70	99.80	99.10	99.30	100.00	98.90	99.60	99.80	99.40	99.50	98.50
Ва	516	1120	622	685	553	648	222	499	401	530	1100
Co	5.9	6.8	5.1	bdl	5.7	bdl	bdl	bdl	bdl	bdl	bdl
Cr	bdl	9.6	bdl	8.0	bdl						
Ga	16.8	15.5	13.0	15.8	15.7	16.3	24.7	19.2	19.1	19.7	20.2
Nb	8.5	9.5	8.8	9.0	7.9	9.7	14.8	13.5	10.4	12.5	17.9
Ni	bdl	2.1	bdl	bdl	bdl	2.3	2.5	2.4	2.2	3.1	bdl
Pb	16.0	13.1	10.7	15.2	13.9	12.5	29.0	32.3	33.1	31.7	32.4
Rb	133	95	63	139	121	129	185	209	240	206	165
Sc	bdl	5.4	5.6	5.7	5.7	bdl	bdl	7.6	bdl	8.0	6.9
Sr	100	193	107	87	121	120	60	72	76	102	241
Та	0.5	0.6	0.5	0.8	0.4	0.8	1.2	1.4	0.8	0.8	0.7
Th	15.7	9.0	12.2	11.6	11.6	13.2	13.1	12.6	25.9	20.2	17.4
U	4.0	2.1	3.1	4.4	3.9	3.0	4.7	3.9	6.8	4.1	3.3
V	11.0	21.3	10.8	6.9	15.1	11.2	bdl	6.1	8.6	12.0	20.7
Y	57.4	44.4	42.6	48.0	43.1	50.7	81.3	96.7	52.3	66.2	48.0
Zn	35.1	58.9	46.5	41.8	42.2	41.7	51.7	59.7	53.7	66.2	89.9
Zr	241.9	262.6	242.9	217.8	246.5	196.6	231.9	305.9	255.6	291.5	421.0
Hf	6.8	7.6	7.5	7.3	6.9	6.1	8.0	9.9	8.2	8.6	10.7
La	72.4	45.7	42.5	36.8	61.0	39.2	31.3	44.2	45.6	52.5	138.3
Ce	144.8	92.1	84.5	72.3	123.2	77.6	68.9	86.1	89.5	102.4	269.4
Pr	17.1	11.0	10.1	8.7	14.5	9.4	9.8	11.4	10.3	11.5	28.3
Nd	68.2	44.6	39.9	36.3	56.3	37.8	43.2	49.3	40.9	50.8	106.9
Sm	14.2	9.4	8.3	7.9	11.4	8.5	11.2	12.5	8.7	11.1	17.7
Eu	1.2	1.7	1.2	1.0	1.5	1.2	1.7	1.2	1.1	1.2	2.8
Gd	10.4	7.4	6.7	7.0	8.5	7.0	9.8	11.8	7.5	9.6	11.9
Tb	1.9	1.3	1.2	1.3	1.4	1.3	2.1	2.4	1.4	1.7	1.8
Dv	10.4	7.4	7.3	7.5	7.6	8.0	12 4	14.8	7.8	10.2	9.1
_, Но	2.1	1.6	16	1.7	1.5	1.8	2.7	3.2	1.6	2.2	1.7
Fr	59	4.3	4.5	50	4 1	53	83	10.0	4.8	6.6	4.5
Tm	0.8	0.6	07	0.0	0.6	0.8	14	1.5	0.8	1.0	0.6
Yh	4.9	.3.8	4.0	47	3.6	4.9	82	8.8	4.9	5.6	3.5
10	07	0.6	07	0.8	0.6	0.8	12	1.3	07	0.9	0.5
Lu	0.7	0.0	0.7	0.0	0.0	0.0			0.7	0.0	0.0

Sample	ROG416	MM 026153	MM 026173	MM 036672	MM 036673	MM 036677	MM 036681	MM 036682	MM 036686	MM 036692	MM 036693
UTM x	347437	343454	338888	352723	353796	354078	345295	344831	345144	345953	345932
UTM y	6593415	6592899	6591831	6595827	6596944	6593768	6603186	6603219	6604380	6606022	6606001
Suite	Granitoid	Amphibolt									
SiO2	69.40	51.18	50.77	48.90	56.70	60.20	53.00	50.20	50.70	55.90	48.60
AI2O3	15.10	13.03	13.03	18.30	17.90	18.20	16.00	16.50	13.00	15.40	15.10
Fe2O3	3.65	15.84	15.48	9.36	8.11	5.86	11.00	9.59	10.30	12.10	15.50
TiO2	0.25	2.45	2.16	0.67	0.88	0.73	1.81	0.99	0.82	1.26	1.88
MgO	0.26	4.17	4.28	6.27	1.48	1.05	2.35	5.74	9.80	1.77	4.27
CaO	1.73	7.93	7.82	11.90	6.09	5.28	6.40	9.77	9.41	5.67	7.81
Na2O	4.07	2.85	2.92	2.14	3.82	4.21	3.73	2.63	1.97	3.17	3.63
K2O	4.67	1.29	1.13	1.18	2.04	2.13	1.62	0.96	1.63	2.12	1.13
MnO	0.08	0.21	0.22	0.16	0.13	0.09	0.17	0.13	0.16	0.17	0.26
P2O5	0.07	0.35	0.38	0.12	0.27	0.19	0.55	0.09	0.17	0.33	0.27
LOI	0.78	0.59	1.04	1.49	0.93	0.62	1.22	1.60	1.56	1.17	1.14
Total	100.00	99.89	99.22	100.00	98.30	98.50	97.90	98.20	99.50	99.00	99.50
Ba	512	207	202	257	301	547	609	300	300	403	265
Co	bdl	62.0	60.0	40.8	15.6	11.4	21.7	36.1	51.7	24.0	45.7
Cr	bdl	53.0	56.0	46.0	8.5	6.9	5.1	82.3	629.0	4.9	bdl
Ga	26.8	20.0	23.0	16.4	20.7	20.8	22.1	16.6	12.6	22.6	19.1
Nb	18.3	6.3	9.6	3.6	10.0	9.9	19.3	3.6	2.8	7.0	4.2
Ni	bdl	31.0	28.0	5.3	bdl	bdl	bdl	11.2	105.0	bdl	bdl
Pb	26.2	bdl	bdl	17.2	19.0	13.7	17.1	14.7	18.3	26.4	25.4
Rb	133	43	35	45	96	98	59	29	65	118	45
Sc	bdl	36.0	39.0	43.2	22.4	15.1	20.4	28.3	31.6	25.7	35.7
Sr	135	191	246	356	358	321	522	460	258	285	145
Та	0.8	0.4	0.5	0.2	0.7	0.7	0.9	0.2	0.2	0.4	0.3
Th	9.6	3.2	2.9	1.6	1.8	4.5	5.0	1.3	1.5	1.9	1.6
U	2.8	1.3	1.0	1.3	2.2	1.5	1.9	0.5	0.7	1.9	0.9
V	5.5	414.0	417.0	180.0	49.8	31.5	79.9	219.0	167.0	67.2	262.0
Y	78.3	59.1	52.5	20.8	37.0	49.9	41.0	15.1	16.4	76.9	60.2
Zn	80.5	131.0	134.0	78.5	117.0	81.0	147.0	78.8	83.2	137.0	142.0
Zr	508.0	189.1	178.5	104.4	199.2	116.9	272.6	71.1	60.4	271.4	168.0
Hf	11.5	5.6	5.6	2.8	4.6	3.2	6.2	1.9	1.7	7.4	4.9
La	54.6	19.5	23.8	17.7	18.1	21.5	38.0	9.6	8.0	23.3	12.8
Ce	134.6	45.4	54.4	38.5	51.0	52.0	86.7	22.4	17.8	55.5	29.5
Pr	16.3	6.6	7.6	4.2	6.5	7.1	11.1	2.8	2.4	7.6	4.4
Nd	71.5	29.7	35.4	17.5	27.9	31.2	48.9	12.8	11.2	36.6	22.2
Sm	16.5	8.6	8.4	4.0	7.1	8.3	10.4	3.1	3.1	10.3	7.0
Eu	3.4	2.5	2.5	1.5	2.6	2.0	4.1	1.4	1.2	2.2	2.2
Gd	13.4	9.1	8.9	3.8	6.7	8.5	9.4	3.0	3.0	10.2	7.7
Tb	2.4	1.6	1.5	0.7	1.2	1.6	1.6	0.6	0.6	2.0	1.5
Dy	13.4	10.0	9.2	4.3	7.0	8.9	8.4	3.1	3.3	12.7	9.6
Ho	2.7	2.1	1.9	0.9	1.4	1.9	1.7	0.6	0.7	2.8	2.1
Er	7.8	5.5	4.9	2.5	4.1	5.3	4.6	1.7	1.9	7.5	6.0
Tm	1.2	0.8	0.8	0.4	0.7	0.8	0.6	0.2	0.3	1.1	1.0
Yb	6.9	5.2	4.9	2.5	4.0	5.2	3.8	1.5	1.7	6.6	5.7
Lu	1.0	0.8	0.7	0.4	0.6	0.8	0.6	0.2	0.2	1.0	0.9

Sample	MM 036695	MM 036694	MM 036698	MM 036699	MM 036711	MM 036712	MM 036713	ROG394	ROG399	ROG421	MM 026152
UTM x	346319	346424	346039	346015	350822	351583	353018	345803	344289	354199	343401
UTM y	6606505	6606658	6606404	6606353	6603975	6603907	6603991	6595821	6594908	6595345	6592974
Suite	Amphibolt	Grey Gneiss									
SiO2	50.80	60.20	50.70	50.80	63.30	64.30	63.20	50.20	49.50	48.60	70.64
AI2O3	13.10	15.40	13.10	12.80	15.20	15.80	16.00	13.00	13.20	15.40	13.77
Fe2O3	15.80	7.15	15.80	16.20	6.99	5.60	5.71	16.00	15.80	13.20	3.81
TiO2	2.25	0.95	2.22	2.77	0.89	0.70	0.74	2.55	2.22	2.76	0.41
MgO	4.44	0.94	4.40	3.84	0.99	0.71	0.78	4.64	4.59	4.22	0.61
CaO	7.75	4.32	7.74	7.42	3.62	3.11	3.27	8.35	8.27	8.22	2.40
Na2O	2.60	4.55	2.55	2.76	3.75	4.19	4.22	2.81	2.98	2.77	3.40
K2O	1.18	2.88	1.16	1.38	3.41	3.73	3.72	1.23	0.94	2.08	3.89
MnO	0.23	0.15	0.24	0.23	0.12	0.09	0.09	0.22	0.23	0.18	0.07
P2O5	0.39	0.28	0.38	0.59	0.32	0.22	0.24	0.43	0.37	1.39	0.09
LOI	1.23	2.00	1.23	0.92	0.84	0.61	0.60	0.48	0.70	1.00	0.61
Total	99.80	98.80	99.50	99.70	99.40	99.00	98.60	99.90	98.80	99.80	99.69
Ba	2220	2020	233	342	1290	1560	1350	220	200	415	737
Co	13.9	9.7	48.9	47.6	11.0	8.4	9.7	49.2	44.0	28.3	7.0
Cr	bdl	bdl	33.5	7.8	bdl	bdl	bdl	43.3	41.0	bdl	21.0
Ga	20.9	19.4	18.2	20.0	20.4	20.1	20.9	21.9	20.8	21.3	14.0
Nb	11.1	25.8	10.6	8.6	23.6	20.8	23.0	7.0	10.2	11.7	11.8
Ni	bdl	bdl	19.9	7.6	bdl	bdl	bdl	34.6	23.9	bdl	bdl
Pb	15.0	14.5	31.1	26.8	20.2	13.3	18.5	14.6	14.2	14.5	23.0
Rb	62	70	35	42	77	66	80	39	25	79	176
Sc	16.9	15.2	34.8	36.5	13.6	10.2	13.9	32.7	29.1	20.2	bdl
Sr	465	354	186	191	384	380	364	195	210	500	147
Та	0.6	0.9	0.6	0.5	1.1	0.8	1.1	0.4	0.5	0.6	0.8
Th	3.5	4.2	3.3	3.8	5.1	4.0	5.7	2.8	2.8	2.8	16.2
U	1.2	1.7	1.2	1.4	1.6	1.3	2.1	1.2	1.0	1.2	4.8
V	22.0	17.7	364.0	289.0	24.6	16.3	22.4	332.0	369.0	228.0	20.0
Y	62.6	40.3	61.1	70.3	45.8	33.3	42.8	59.0	58.6	37.2	52.7
Zn	145.0	123.0	142.0	149.0	125.0	102.0	107.0	138.0	145.0	139.0	118.0
Zr	246.7	1008.6	243.4	304.1	577.2	640.6	599.9	210.9	201.4	117.2	258.8
Hf	6.9	21.1	6.8	8.2	14.0	14.9	14.9	6.0	5.9	3.0	8.7
La	24.8	43.7	23.5	25.3	53.0	44.1	51.3	19.9	25.1	38.2	47.2
Ce	55.2	97.4	53.3	57.6	120.6	96.9	111.2	47.1	57.1	89.2	98.0
Pr	7.6	11.9	7.5	8.6	15.3	11.7	13.8	7.0	8.2	11.9	11.6
Nd	36.2	51.7	34.8	41.7	64.9	52.4	57.4	33.8	37.6	53.9	47.3
Sm	9.7	10.6	9.2	11.5	13.8	10.3	12.1	9.3	9.2	10.6	9.7
Eu	2.6	4.4	2.6	3.3	3.8	3.8	3.7	2.6	2.2	2.7	1.6
Gd	8.9	8.1	8.4	10.7	9.6	7.6	8.8	9.0	8.7	8.1	8.2
Tb	1.6	1.3	1.6	2.0	1.6	1.2	1.4	1.7	1.7	1.3	1.5
Dy	10.1	7.0	9.7	11.6	8.5	6.3	7.8	9.8	9.7	6.5	8.4
Ho	2.3	1.5	2.1	2.6	1.8	1.3	1.6	2.1	2.1	1.3	1.8
Er	6.4	3.9	6.1	7.1	4.6	3.4	4.5	6.1	5.9	3.5	4.8
Tm	1.0	0.6	0.9	1.1	0.7	0.5	0.6	0.9	0.9	0.5	0.8
Yb	5.8	3.7	5.6	6.2	3.9	3.2	4.0	5.5	5.5	2.6	4.6
Lu	0.9	0.6	0.9	1.0	0.6	0.5	0.6	0.8	0.9	0.4	0.7

Sample	MM 026157	MM 026160	MM 026161	MM 026166	MM 026170	MM 026171	MM 026181	MM 026263	MM 026265	MM 036575	MM 036576
UTM x	344535	336908	336803	339975	339629	339456	338373	351926	352436	345495	343349
UTM y	6595278	6587700	6587753	6593759	6593023	6592844	6588018	6600846	6600597	6596435	6592617
Suite	Grey Gneiss										
SiO2	62.88	66.03	65.35	53.74	55.08	64.49	68.80	74.30	64.50	52.90	68.10
AI2O3	17.82	15.63	16.68	17.72	18.04	17.54	13.97	13.30	16.00	13.30	15.20
Fe2O3	4.31	5.25	3.71	7.38	7.30	3.91	4.68	1.64	4.34	11.10	4.38
TiO2	0.50	0.57	0.52	0.87	0.97	0.36	0.32	0.18	0.60	0.68	0.49
MaO	1.08	1.78	0.79	6.00	4.40	1.90	2.54	0.45	2.69	7.85	1.11
CaO	4.27	3.78	4.11	8.94	6.75	4.30	3.47	1.48	3.62	9.16	2.95
Na2O	4.59	2.90	4.00	2.79	2.98	3.21	2.91	3.42	3.50	2.30	3.54
K20	2.28	2 37	2 12	1.08	2 21	2.26	2 34	3.98	3 20	1 11	3.28
MnO	0.05	0.08	0.05	0.13	0.12	0.05	0.10	0.04	0.06	0.19	0.06
P2O5	0.11	0.10	0.13	0.12	0.19	0.10	0.08	0.05	0.13	0.10	0.11
1.00	1 28	1 14	0.67	1 30	1.96	1.96	0.00	0.58	1 19	1.05	0.76
Total	00.17	00.63	0.07	100.07	100.00	100.07	00.14	0.00	00.00	00 70	0.70
Total	55.17	33.03	50.12	100.07	100.00	100.07	33.33	33.40	33.30	33.70	33.30
Ba	538	565	6/3	238	117	570	540	576	131	2/3	705
Da	10.0	11.0	043	230	24.0	11.0	15.0	bdl	434	243	105
00	10.0	11.0	9.0	24.0	24.0	01.0	15.0		00.0	770.0	4.9
	25.0	45.0	29.0	204.0	10.0	01.0	09.0	1.0	90.0	170.0	21.9
Ga	23.0	19.0	21.0	18.0	19.0	16.0	12.0	13.5	18.0	17.4	20.0
ND	7.4	9.9	10.7	3.2	11.1	0.7	5.5	0.2	0.0	3.5	9.0
NI	6.0	5.0	6.0	36.0	25.0	10.0	11.0	2.7	28.2	60.7	4.7
Pb	bdi	bdi	12.0	bdi	bdi	12.0	bdi	31.9	21.7	21.3	35.8
Rb	117	110	127	43	97	101	70	169	150	36	131
Sc	10.0	23.0	18.0	33.0	26.0	21.0	19.0	bdl	6.2	33.3	9.3
Sr	371	233	281	432	445	384	214	136	297	171	196
Та	0.5	0.8	0.5	0.2	0.8	0.4	0.5	0.6	0.5	0.2	0.7
Th	8.0	7.1	16.6	4.6	5.1	8.2	4.7	6.0	9.7	1.0	11.1
U	3.1	1.2	2.2	1.3	3.1	3.0	5.3	2.8	5.0	0.6	5.3
V	32.0	49.0	29.0	136.0	123.0	36.0	87.0	8.8	61.4	206.0	41.0
Y	24.1	23.2	39.9	16.2	28.5	23.2	24.3	13.0	22.7	27.1	37.1
Zn	45.0	89.0	67.0	82.0	82.0	57.0	59.0	29.0	54.9	115.0	66.9
Zr	374.6	159.0	339.1	58.5	152.2	167.1	96.9	135.3	202.2	76.4	191.3
Hf	11.6	5.2	10.7	2.0	4.8	5.2	3.1	4.5	5.3	2.4	5.7
La	31.0	32.4	57.0	13.1	25.3	25.8	25.0	13.2	22.8	12.2	36.2
Ce	57.3	64.7	116.5	27.1	45.0	52.7	55.4	23.2	47.6	30.6	74.1
Pr	6.6	7.9	13.8	3.5	5.8	6.1	7.0	2.3	5.3	3.9	8.7
Nd	24.6	31.4	53.3	15.5	24.4	24.2	29.1	8.7	21.3	17.6	36.5
Sm	5.0	6.7	11.1	3.7	5.7	4.8	5.2	1.8	4.3	4.2	7.8
Eu	1.5	1.5	2.2	1.2	1.9	1.2	0.9	0.6	1.0	1.0	1.5
Gd	3.9	5.3	9.1	3.1	5.0	4.0	4.3	1.5	3.4	3.8	6.4
Tb	0.7	0.8	1.4	0.5	1.1	0.7	0.6	0.3	0.6	0.7	1.1
Dy	4.2	4.5	7.7	2.7	4.8	4.1	4.1	1.7	3.6	4.4	6.6
Ho	0.8	0.8	1.4	0.6	1.3	0.8	0.8	0.4	0.8	1.0	1.4
Er	2.3	2.1	3.4	1.5	2.7	2.2	2.3	1.2	2.3	3.0	4.0
Tm	0.4	0.3	0.5	0.2	0.7	0.3	0.4	0.2	0.3	0.5	0.6
Yb	2.5	1.8	3.0	1.4	2.6	2.0	2.6	1.5	2.2	3.0	3.7
Lu	0.4	0.2	0.4	0.2	0.7	0.3	0.4	0.2	0.3	0.5	0.6

Sample	MM 036577	MM 036591	MM 036594	MM 036595	MM 036600	MM 036601	MM 036671	MM 036674	MM 036675	MM 036678	MM 036680
UTM x	344087	334955	334829	334497	333330	334950	351638	352446	352254	359462	359804
UTM y	6594373	6590672	6590472	6590203	6590247	6590560	6595280	6594152	6594065	6596440	6597146
Suite	Grey Gneiss										
SiO2	71.10	67.10	69.50	70.30	65.10	69.30	52.40	58.40	58.40	74.80	72.10
AI2O3	13.20	15.40	14.60	14.50	16.90	14.70	19.70	17.60	17.60	12.30	12.50
Fe2O3	3.10	4.58	2.50	1.90	3.71	2.68	7.72	6.63	7.26	2.57	4.94
TiO2	0.28	0.59	0.37	0.31	0.53	0.41	1.43	0.69	0.65	0.20	0.48
MaO	0.24	0.91	0.53	0.44	1.05	0.57	3.29	2.44	2.81	0.05	0.44
CaO	1.53	3.98	1.73	1.39	4.56	1.94	8.82	6.00	5.98	0.72	1.50
Na2O	3.02	3.08	2.89	3.33	3.63	3.30	2.63	3.67	3.20	3.82	3.15
K20	5 17	2 67	5 54	5.61	2.51	5.02	1 77	1 69	1 40	3.64	4 34
MnO	0.05	0.06	0.03	0.03	0.05	0.03	0.10	0.10	0.10	0.05	0.08
P205	0.05	0.15	0.00	0.09	0.15	0.13	0.19	0.19	0.21	0.01	0.14
1200	0.00	1 14	0.72	0.00	1 32	0.65	1 78	1 16	1.61	0.26	0.28
Total	98.00	00.60	98.60	0.71	00.50	0.00	00 00	08.50	00.20	0.20	0.20
Total	30.00	33.00	30.00	30.70	33.30	30.00	33.30	30.50	33.20	30.40	33.30
Bo	701	090	000	720	709	1090	44.4	404	222	614	626
Ба	791	909	990	7.30	700	1000	414	421	322	014 ball	020
0			DOI		5.2		20.7	17.3	23.0	DOI	0.3
Cr	10.0	9.1		4.8	15.3	4.7	9.8	24.3	26.1	DOI	
Ga	19.7	21.6	19.3	21.4	22.4	19.1	18.5	18.2	17.4	18.9	19.2
Nb	11.1	9.8	10.7	13.5	10.3	8.7	5.8	5.2	3.6	5.5	9.1
Ni	2.5	bdl	2.2	2.1	4.9	bdl	bdl	4.8	11.4	bdl	bdl
Pb	41.8	27.9	40.9	45.0	27.5	36.4	15.7	10.0	10.6	11.7	19.0
Rb	190	115	173	224	120	176	70	59	59	85	149
Sc	5.6	8.5	bdl	bdl	5.5	bdl	34.8	15.2	14.7	bdl	19.1
Sr	108	379	183	209	436	255	349	438	430	73	93
Та	0.8	0.5	0.6	0.9	0.4	0.3	0.5	0.3	0.2	0.4	0.6
Th	15.2	11.1	20.8	41.0	13.6	22.3	1.1	1.8	6.4	9.7	8.9
U	3.4	2.1	2.7	5.0	1.4	2.6	0.8	1.3	2.5	2.3	3.6
V	8.1	24.5	20.5	17.4	29.5	23.0	197.0	77.3	85.9	bdl	17.7
Y	57.0	21.4	25.4	12.6	25.5	14.8	21.3	18.6	14.2	69.4	71.6
Zn	53.8	85.8	63.5	72.1	64.5	58.2	66.1	76.3	80.3	45.4	118.0
Zr	329.1	381.4	332.2	297.0	342.2	355.4	73.6	153.5	82.0	416.3	283.7
Hf	9.3	9.9	8.9	8.1	8.8	9.9	2.0	3.8	2.1	11.8	8.1
La	55.4	79.3	71.0	68.2	54.4	76.4	14.0	13.4	12.0	31.7	30.2
Ce	105.6	145.8	138.5	118.6	107.2	142.3	30.7	33.8	27.3	75.7	67.6
Pr	13.2	15.8	16.0	12.4	12.6	17.2	3.6	4.2	3.4	9.0	8.7
Nd	53.2	58.9	62.3	45.2	53.2	66.3	15.1	18.2	14.0	40.5	37.7
Sm	11.4	8.8	10.2	6.9	10.0	10.7	3.7	4.3	3.1	10.6	9.4
Eu	1.4	2.0	1.3	0.8	1.9	1.3	1.4	1.4	1.2	1.8	1.8
Gd	9.7	5.7	6.0	4.0	7.6	6.0	4.0	3.9	2.9	10.8	9.9
Tb	1.7	0.8	0.8	0.5	1.1	0.7	0.7	0.7	0.5	2.2	2.0
Dy	9.8	3.9	4.1	2.5	5.3	2.9	4.1	3.6	2.8	13.3	12.2
Ho	2.0	0.8	0.8	0.4	0.9	0.5	0.9	0.8	0.6	3.0	2.8
Er	5.9	2.1	2.5	1.0	2.4	1.4	2.3	2.1	1.4	8.4	7.9
Tm	0.9	0.3	0.4	0.1	0.3	0.2	0.4	0.3	0.2	1.2	1.3
Yb	5.2	2.0	2.5	0.8	1.8	1.3	2.2	2.0	1.4	7.0	7.8
Lu	0.8	0.3	0.4	0.1	0.3	0.2	0.3	0.3	0.2	1.1	1.2

Sample	MM 036683	MM 036688	MM 036690	MM 036700	MM 036701	MM 036702	MM 036704	MM 036706	MM 036710	MM 036714	MM 036715
UTM x	345258	345444	345613	346799	347079	346991	347497	346743	348284	354244	353728
UTM y	6604120	6605437	6605587	6606932	6607172	6606998	6608282	6607670	6602040	6604274	6604119
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
SiO2	70.30	51.10	52.40	52.60	58.90	52.70	77.50	61.50	68.80	68.10	57.40
AI2O3	13.20	18.60	18.00	18.10	16.50	17.20	11.60	16.60	15.90	15.30	16.00
Fe2O3	4.01	7.36	7.42	7.24	6.02	8.59	2.79	5.04	2.49	3.91	8.90
TiO2	0.36	0.68	0.57	0.60	0.60	0.83	0.25	0.54	0.28	0.39	1.03
MqO	0.24	5.24	5.41	5.19	4.21	4.57	0.14	3.25	0.66	0.56	3.06
CaO	1.82	9.14	7.34	8.19	5.53	9.13	1.19	4.66	2.91	1.60	6.80
Na2O	2.79	3.01	2.68	3.13	3.11	2.96	2.52	2.39	4.30	5.54	2.85
K2O	5.05	2.37	3.49	2.46	2.70	1.14	4.02	3.47	2.48	2.84	1.99
MnO	0.05	0.12	0.14	0.13	0.10	0.14	0.06	0.07	0.05	0.06	0.13
P205	0.06	0.29	0.14	0.15	0.05	0.11	0.02	0.07	0.08	0.07	0.21
1.01	0.46	1.63	1 98	1.61	1 64	1.62	0.02	1 90	0.83	0.68	1.33
Total	98.30	99.50	99.60	99.40	99.30	99.00	101.00	99.50	98.80	99.00	99.70
Total	50.50	55.50	55.00	55.40	55.50	55.00	101.00	55.50	50.00	55.00	55.70
Ba	880	610	882	153	583	257	674	640	388	178	501
Co	5.2	20.5	20.9	20 0	25.7	201	bdl	20.0	6 1	9.1	21.4
00 Cr	4.2	64.0	65.0	20.3	25.7	142.0		20.0	0.1	0.1 bdl	01. <del>4</del>
C	4.3	15.2	15.9	15.4	14.9	143.0	0.4	32.1 1E 1	0.0	11.0	20.0
Ga	10.0	15.5	15.2	10.4	14.0	2.4	10.2	10.1	10.3	0.4	15.2
IND NI:	/ <b>3</b> . /	2.0	2.2	1.0	2.7	3.4	11.4 hall	3.0	0.0	0.4 b.dl	0.2
NI Di		32.4	25.4	23.3	10.0	10.4		11.7	2.4	Dai	21.4
PD	19.5	14.3	13.5	12.0	8.7	12.9	10.1	5.6	7.8	3.8	20.6
RD	150	93	141	93	94	38	89	119	110	72	66
Sc	10.0	20.7	21.8	23.0	17.3	28.0	bdi	12.2	bdi	7.6	23.6
Sr	113	630	301	439	239	249	78	241	325	75	188
la	0.7	0.1	0.2	0.1	0.2	0.2	0.7	0.2	0.7	0.7	0.3
l h	7.3	1.5	1.7	2.5	3.7	1.5	7.2	2.8	10.0	8.7	3.2
U	1.3	0.9	0.8	1.1	1.1	1.0	3.0	1.1	3.2	2.5	1.5
V	9.8	115.0	119.0	124.0	133.0	154.0	bdl	107.0	15.6	30.1	151.0
Y	54.9	15.5	18.2	13.6	21.0	34.0	92.0	21.0	27.7	66.6	37.0
Zn	70.0	89.6	87.8	69.0	57.5	83.1	117.0	54.2	49.9	73.6	76.5
Zr	396.0	77.5	106.4	68.6	55.1	114.4	393.0	78.9	142.1	320.8	131.9
Hf	10.6	2.1	2.8	2.0	1.9	3.1	11.6	2.3	4.3	9.9	4.2
La	52.1	16.1	9.4	9.2	9.9	10.7	33.5	10.5	20.5	31.5	18.4
Ce	104.3	41.2	23.6	23.1	22.8	25.5	74.3	23.8	38.7	64.2	43.8
Pr	12.6	5.4	3.0	3.1	2.9	3.3	9.9	2.8	4.5	8.0	5.4
Nd	51.7	23.5	13.7	12.7	11.8	15.1	45.3	12.2	17.5	36.8	23.1
Sm	10.7	5.1	3.4	2.9	3.1	4.3	11.9	3.2	3.7	9.6	5.9
Eu	1.9	1.5	1.1	1.0	0.7	1.2	1.9	0.7	0.8	1.6	1.4
Gd	10.7	3.6	2.8	2.5	2.7	4.2	11.4	2.8	3.2	9.6	5.3
Tb	1.8	0.5	0.5	0.4	0.5	0.9	2.3	0.5	0.6	1.7	1.0
Dy	10.1	2.7	2.9	2.3	3.3	5.4	14.2	3.2	3.8	10.7	6.1
Ho	2.2	0.6	0.6	0.5	0.7	1.2	3.2	0.7	0.9	2.4	1.3
Er	6.1	1.5	1.8	1.3	2.0	3.5	9.7	2.1	2.6	6.7	3.9
Tm	0.9	0.2	0.3	0.2	0.3	0.6	1.5	0.3	0.5	1.1	0.6
Yb	5.1	1.2	1.8	1.2	2.1	3.3	9.3	2.1	3.0	6.5	3.9
Lu	0.8	0.2	0.3	0.2	0.3	0.5	1.5	0.3	0.5	1.0	0.6

Sample	MM 036716	MM 036721	MM 036722	MM 036725	MM 036726	MM 036727	MM 036728	ROG339-1	ROG339-2	ROG340	ROG369
UTM x	353779	355193	355280	355427	356619	356461	356309	357733	357733	357601	344901
UTM y	6604134	6604831	6604847	6604887	6604998	6604978	6604825	6597315	6597315	6597216	6594801
Suite	Grey Gneiss										
SiO2	56.50	51.20	57.00	50.00	71.10	54.90	59.80	72.40	76.20	63.00	67.40
AI2O3	16.70	17.70	16.60	15.70	13.50	16.90	18.00	12.40	12.60	16.60	16.60
Fe2O3	8.44	10.40	9.19	10.50	2.76	7.15	5.18	4.61	2.55	4.63	4.11
TiO2	0.96	1.07	1.12	0.98	0.36	0.84	0.50	0.42	0.19	0.73	0.40
MaO	3.14	5.43	2.93	7.70	0.49	4.99	3.44	0.38	0.08	1.86	0.67
CaO	6.95	9.03	6.66	9.94	1.95	7.39	6.67	1.84	1.16	4.86	2.60
Na2O	2.75	3.15	3.11	2.44	3.09	3.70	3.92	3.91	3.68	3.89	3.70
K20	2 25	0.95	1 72	0.84	4 08	1 76	1 39	3 25	3.93	2 11	4 21
MnO	0.12	0.16	0.13	0.16	0.05	0.12	0.08	0.10	0.07	0.06	0.06
P205	0.12	0.17	0.25	0.18	0.00	0.56	0.00	0.10	0.07	0.00	0.08
1 200	1.28	0.00	0.23	1.06	0.73	1.25	1.04	0.24	0.02	0.10	0.00
Total	00.20	100.00	0.37	00.40	0.75	00.60	100.00	0.24	101.00	0.54	101.00
TOLAI	99.30	100.00	99.70	99.40	90.20	99.00	100.00	99.70	101.00	90.50	101.00
De	540	220	270	1.40	500	202	004	<u> </u>	644	40.4	1000
ва	512	230	370	140	533	363	281	600	644	484	1000
0	29.8	39.7	27.3	50.6	5.3	32.6	23.9	DOI	Dai	7.6	DOI
Cr	28.0	108.0	bdi	235.0	bdi	83.9	49.3	5.4	bdi	33.7	8.8
Ga	15.7	16.0	16.6	13.9	14.3	16.7	15.5	19.6	20.8	21.7	20.1
Nb	4.8	2.5	4.7	2.9	7.0	4.1	2.2	9.9	10.6	6.0	7.8
Ni	20.9	19.7	bdl	111.0	bdl	84.7	41.0	<2	3.5	3.7	2.4
Pb	21.7	18.7	15.1	16.3	12.2	7.2	3.7	25.3	25.3	18.3	22.5
Rb	81	28	59	34	124	43	31	104	132	74	159
Sc	23.8	30.0	22.5	34.4	7.0	18.8	14.2	12.4	14.8	6.1	5.8
Sr	178	280	319	248	172	649	510	100	70	468	231
Та	0.2	0.2	0.3	0.2	0.5	0.1	0.2	0.6	0.7	0.4	0.5
Th	1.9	1.6	4.9	1.0	11.0	1.8	1.7	8.7	10.7	5.5	18.9
U	1.0	0.7	2.5	0.4	4.1	1.3	1.4	2.7	4.0	2.0	2.4
V	143.0	140.0	139.0	183.0	22.2	113.0	70.1	10.0	bdl	56.2	14.2
Y	39.2	34.0	38.8	20.3	33.4	16.0	9.8	85.8	103.9	16.9	31.0
Zn	85.4	89.7	92.2	76.7	38.3	75.2	49.1	100.0	119.0	75.5	47.7
Zr	127.3	89.3	159.0	73.3	223.4	100.7	67.8	297.1	361.5	166.8	471.1
Hf	3.9	2.5	4.1	1.8	6.3	2.4	1.8	9.2	10.6	4.8	14.1
La	16.8	9.1	17.7	8.1	33.1	20.5	9.3	32.8	44.8	20.3	59.2
Ce	40.4	21.5	41.7	20.4	69.4	56.1	20.6	69.7	83.3	38.2	146.0
Pr	5.3	3.0	5.5	2.7	8.5	7.9	2.5	9.3	11.8	4.7	13.7
Nd	23.6	13.7	24.8	12.8	33.0	34.9	10.9	42.1	53.4	20.3	50.5
Sm	6.1	4.0	6.2	3.4	6.8	7.3	2.4	11.0	13.9	4.2	9.3
Eu	1.3	1.4	1.7	1.2	0.9	2.0	0.8	1.9	2.2	1.4	1.7
Gd	5.6	4.5	5.5	3.1	5.6	4.9	1.9	10.8	13.5	3.3	6.1
Tb	1.1	0.9	1.1	0.6	0.9	0.7	0.3	2.2	2.7	0.6	1.0
Dv	6.5	5.3	6.2	3.5	5.4	3.4	1.7	- 13.1	16.1	2.8	5.5
_, Но	15	12	1.3	07	12	0.6	04	30	35	0.6	1 1
Fr	40	34	30	21	35	15	0.4	9.0 9.3	10 4	15	32
Tm	 0.6	0.5	0.5	03	0.6	0.2	0.9	1 1	16	0.2	0.5
Vh	0.0 3.8	3.3	3.0	10	3.6	13	0.1	1.4 8 1	0.6	1 1	3.0
1	0.6	5.5 0 F	0.8	1.9	0.0	1.3	0.9	1.2	3.0 1 E	0.2	5.U 0 E
Lu	0.0	0.5	0.0	0.3	0.0	0.2	0.1	1.3	1.5	0.2	0.5

Sample	ROG393	ROG395	ROG397	ROG398	ROG403	ROG404	ROG405	ROG406	ROG407	ROG408	ROG409
UTM x	345891	345145	344576	344306	343761	343312	342955	342735	342453	342330	342124
UTM y	6595966	6595826	6595353	6594918	6593317	6592601	6591765	6591576	6590679	6590245	6589555
Suite	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss	Grey Gneiss
SiO2	66.20	63.60	61.60	55.20	67.60	66.10	52.40	48.00	69.50	66.30	66.70
AI2O3	16.30	15.30	15.90	18.10	14.40	15.70	18.40	17.90	14.30	14.70	14.90
Fe2O3	4.35	5.50	7.05	8.16	4.03	4.95	8.21	9.28	3.00	4.67	4.14
TiO2	0.52	0.77	0.97	0.91	0.43	0.56	0.98	1.24	0.38	0.60	0.50
MgO	1.53	2.17	2.94	2.41	1.01	1.38	4.39	7.72	0.62	2.54	1.16
CaO	3.76	4.46	3.63	8.08	2.72	3.88	7.78	8.04	2.19	2.67	3.17
Na2O	3.90	2.55	1.87	2.95	3.31	3.57	2.96	1.94	3.31	2.70	3.07
K2O	2.18	3.10	3.28	2.04	3.69	2.92	2.54	2.82	3.88	3.22	3.59
MnO	0.06	0.07	0.08	0.10	0.07	0.07	0.11	0.13	0.04	0.07	0.06
P2O5	0.14	0.13	0.17	0.20	0.10	0.13	0.23	0.24	0.10	0.11	0.11
LOI	1.05	1.39	2.11	1.47	0.65	0.73	1.96	2.56	0.90	2.12	0.90
Total	100.00	99.10	99.60	99.70	98.00	100.00	100.00	99.90	98.20	99.70	98.30
Ba	566	607	695	326	757	484	567	453	1290	781	667
Co	5.3	10.0	11.2	11.4	bdl	6.1	18.8	31.4	bdl	8.7	5.6
Cr	32.1	59.7	120.0	8.6	16.7	54.7	94.3	346.0	5.2	113.0	17.4
Ga	18.2	18.7	19.4	34.2	17.0	19.6	23.8	20.1	16.7	18.3	19.3
Nb	8.3	10.5	13.3	7.2	9.2	9.2	7.1	4.5	7.8	9.8	10.1
Ni	4.2	7.1	16.3	bdl	4.4	9.9	27.4	99.5	<2	17.1	5.2
Pb	18.5	21.4	21.8	13.7	38.3	27.6	42.0	13.1	25.0	16.8	19.5
Rb	86	133	168	79	136	135	89	124	98	135	146
Sc	10.3	8.8	15.9	10.3	bdl	10.0	17.3	18.2	bdl	9.7	9.8
Sr	465	220	278	580	184	211	416	352	184	160	222
Та	0.3	0.7	1.0	0.5	0.7	0.7	0.4	0.2	0.5	0.7	0.7
Th	7.0	10.0	12.0	6.1	12.0	6.9	3.1	0.6	10.4	9.2	11.8
U	1.1	1.9	3.2	2.3	2.1	2.1	1.7	0.4	1.6	2.5	3.4
V	45.3	61.8	98.8	115.0	31.5	46.8	117.0	148.0	16.5	49.2	38.5
Y	18.6	40.0	49.2	31.2	40.4	42.5	33.7	14.1	17.8	34.0	43.8
Zn	59.0	70.1	90.5	40.0	69.9	79.6	108.0	110.0	57.4	67.3	51.0
Zr	162.8	256.2	264.3	132.0	192.7	211.6	218.4	64.8	288.4	214.0	204.3
Ht	5.0	7.5	7.8	3.9	5.7	5.6	5.3	1.7	7.4	5.8	5.6
	00.4	05.7	40.0	00.0	07.4	007	00.0	11.0	70.0	00.0	00.0
La	33.4	35.7	43.2 95 5	23.8	37.1	20.7	20.0	20.1	13.2	32.0	30.0
Ce	74	72.0	10.7	40.0	70.4	77	52.5	30.1	133.3	7.0	72.4
FI Nd	7.4	0.0	10.7	0.3	0.0	7.7 22 E	7.0	4.0	14.0 59.5	7.9	0.0
Nu Sm	5.5	30.0 7.0	43.2	25.4	30.3	33.5	32.4	25	00.0	52.5	37.1 0 0
Sm	0.0	1.0	9.0	5.5 1 E	1.2	1.0	7.0	3.5	0.3	0.0	0.0
Eu	1.2	1.4	7.9	1.0	1.4 5.0	1.5	1.9	1.4	1.7	1.Z E 4	1.2
Gu Th	4.U	1.3	1.0	4.0 0.0	0.9 1 1	0.Z	1.0	2.0 0.5	4.9 07	0.4	1.2
	0.0	1.2	1.4 o 1	0.9	1.1 6.1	1.2	1.0	0.0	0.7	0.9	1.Z
Dy Ha	3.3 0 7	0.0	0.1	4.9	0.1	0.Z	υ.Ծ 1 1	2.0 0.5	3.U 0.E	0.4 1 0	0.0
110 Er	1.0	1.4	1.0 5.1	1.1	1.3	1.4	1.1	0.0 1 E	17	2.2	1.4
	1.9	4.U 0.6	0.1	J.∠ 0 5	3.9 0.6	4.U 0.6	3.3 0.5	1.0	1.7	3.3 0.5	4.4
1111 Vh	17	37	0.0 4 0	3.1	0.0 3.8	0.0 3.8	3.1	13	1.6	3.1	4.0
10	03	0.5	 0.7	0.5	0.6	0.0	0.5	0.2	0.2	0.5	4.0 0.6
Lu	0.5	0.0	0.7	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0

Sample	ROG410	ROG411	SA7-92	SA7-128	SA7-80	SA7-91	SA7-129	SA7-133	SA8-016	SA7-123	SA7-124
UTM x	347762	348534	359281	353598	348988	338383	352845	361341	356709	353964	353964
UTM y	6595136	6594400	6642829	6604075	6603505	6627090	6604012	6599002	6640857	6604111	6604110
Suite	Grey Gneiss	Grey Gneiss	Granitoid	Hybrid	Hybrid						
SiO2	64.30	58.50	76.29	65.65	74.13	75.57	65.27	63.46	68.54	63.42	58.48
AI2O3	18.70	16.90	0.16	0.78	0.06	0.15	0.74	0.82	0.64	0.74	1.59
Fe2O3	3.11	8.51	11.91	14.48	13.03	12.28	14.54	15.50	13.75	14.86	13.81
TiO2	0.37	0.86	1.49	5.91	0.95	2.00	5.47	4.31	4.67	7.00	11.51
MgO	1.34	2.31	0.02	0.11	0.04	0.03	0.09	0.06	0.07	0.13	0.17
CaO	4.16	5.33	0.11	0.80	0.16	0.00	0.77	2.04	0.53	1.55	2.06
Na2O	4.81	3.23	0.68	3.04	0.74	0.57	2.79	3.06	2.04	3.88	5.28
K2O	1.75	2.43	3.05	3.87	3.82	4.34	4.02	3.16	3.80	4.16	3.89
MnO	0.04	0.13	5.21	3.63	4.60	4.57	4.26	5.24	4.30	2.68	2.31
P2O5	0.11	0.18	0.01	0.23	0.02	0.01	0.21	0.31	0.09	0.17	0.27
LOI	1.39	1.40	0.34	0.85	0.36	0.39	0.56	1.31	0.46	0.88	0.66
Total	100.00	99.80	99.28	99.34	97.90	99.91	98.72	99.27	98.91	99.47	100.02
Ва	401	646	468	1641	422	803	1661	2086	1757	482	420
Co	5.3	13.7	1.8	10.5	bdl	2.0	9.4	15.3	7.4	17.5	30.1
Cr	22.3	6.6	4.0	2.1	7.4	bdl	bdl	45.0	1.9	2.3	bdl
Ga	17.5	20.6	16.1	22.6	13.5	23.1	20.5	19.1	21.2	19.0	20.6
Nb	2.9	5.9	9.1	23.5	5.7	17.2	20.5	10.7	14.5	6.8	5.7
Ni	7.7	bdl	bdl	bdl	bdl	bdl	bdl	31.1	bdl	bdl	bdl
Pb	15.6	14.9	19.0	16.0	34.3	7.0	18.0	28.0	18.9	13.2	11.4
Rb	72	87	178	77	196	110	87	117	105	128	89
Sc	bdl	15.4	4.3	16.0	3.6	1.5	11.4	8.8	9.1	15.3	25.9
Sr	358	240	47	355	83	100	325	742	125	190	178
Та	0.2	0.4									
Th	2.5	0.8	17.7	4.1	12.7	12.0	5.3	7.2	15.8	4.4	5.3
U	1.2	0.7	5.6	2.6	5.9	4.2	2.5	1.3	8.7	2.7	3.1
V	35.0	111.0	7.4	24.0	5.3	4.4	22.9	62.7	29.1	76.2	175.0
Υ	4.3	33.2	47.9	49.9	28.2	90.2	46.6	27.3	64.1	68.6	60.4
Zn	35.1	99.7	35.9	105.5	18.4	113.0	104.4	70.2	88.9	147.1	119.4
Zr	118.2	93.3	162	684	71	367	589	359	593	192	189
Hf	2.9	2.5									
La	8.7	13.3	44.0	37.5	15.5	43.3	39.2	61.6	31.9	16.7	17.9
Ce	13.8	37.2	94.7	86.6	24.5	95.0	91.2	109.3	70.7	39.3	40.9
Pr	1.3	4.5									
Nd	5.1	20.3	44.0	49.4	13.6	52.8	51.3	45.9	39.7	25.4	21.8
Sm	0.8	4.9									
Eu	0.7	1.2									
Gd	0.7	4.2									
Tb	< 0.1	0.9									
Dy	0.6	5.2									
Ho	0.1	1.1									
Er	0.4	3.3									
Tm	< 0.1	0.5									

Yb 0.5

Lu 0.1 0.5

3.5

Sample	SA3-02	SA3-49	SA7-38	SA7-79	SA7-86	SA7-104	SA7-111	SA7-112	SA7-114	SA7-131	SA7-132
UTM x	347387	345238	346143	345227	345526	343753	357352	357352	357352	359893	359892
UTM y	6607361	6603123	6606454	6605324	6603195	6601103	6605321	6605321	6605321	6596991	6596990
Suite	Amphibolite	Amphibolt									
SiO2	63.83	53.40	61.70	67.50	57.91	50.95	49.46	49.69	49.57	48.12	47.54
AI2O3	0.71	1.96	1.00	0.61	0.93	2.48	1.60	1.64	1.66	2.54	2.51
Fe2O3	15.35	16.65	15.21	12.59	17.66	12.98	13.01	13.03	13.62	13.32	13.12
TiO2	7.40	10.56	8.09	6.12	8.68	15.83	14.45	14.34	14.70	16.98	19.25
MgO	0.07	0.13	0.14	0.13	0.11	0.22	0.24	0.23	0.24	0.28	0.26
CaO	1.24	2.46	1.02	0.67	1.25	4.48	6.50	6.44	6.10	5.18	5.84
Na2O	3.96	7.06	3.57	2.57	5.22	7.88	10.51	10.73	9.93	7.41	4.45
K2O	4.62	4.28	4.07	4.34	4.76	3.28	2.24	2.31	2.45	2.55	1.69
MnO	0.86	1.44	3.55	3.38	2.39	1.11	0.80	0.73	0.81	2.77	5.00
P2O5	0.19	0.54	0.28	0.18	0.23	0.38	0.13	0.13	0.13	0.39	0.40
LOI	1.48	1.12	0.99	0.69	0.73	0.89	1.03	1.05	1.18	0.64	0.81
Total	99.71	99.59	99.62	98.77	99.87	100.47	99.97	100.32	100.39	100.16	100.88
Ba	363	375	2195	651	671	228	132	118	135	389	953
Co	0.8	bdl	13.8	10.2	16.3	54.8	48.3	50.4	48.2	51.6	65.6
Cr	6.8	16.0	bdl	bdl	7.0	39.0	155.0	155.6	135.7	33.7	32.5
Ga	20.8	37.4	22.8	18.4	30.8	21.0	19.4	18.5	20.7	23.1	22.2
Nb	26.0	53.8	27.5	6.9	9.8	6.4	2.4	2.3	2.8	8.4	8.4
Ni	1.7	6.5	bdl	bdl	bdl	26.9	25.6	24.7	22.2	25.9	29.9
Pb	41.9	47.9	11.0	17.4	13.6	6.4	5.4	4.7	6.6	6.2	7.5
Rb	430	1223	65	89	87	34	25	22	25	93	217
Sc	19.6	24.1	15.9	17.1	17.1	36.6	52.1	51.2	49.3	39.8	37.2
Sr	320	527	426	106	476	186	157	167	189	170	121
Та											
Th	5.8	4.2	3.2	9.1	6.1	2.7	0.2	bdl	0.9	2.0	3.1
U	2.1	0.3	1.9	4.3	2.4	2.0	1.1	0.7	1.3	1.7	2.6
V	71.5	118.0	25.0	24.5	68.8	391.9	380.6	381.8	387.5	403.2	429.5
Y	62.8	57.0	52.7	62.6	90.6	57.1	35.1	35.5	37.1	61.1	61.2
Zn	68.7	162.5	161.2	100.4	132.3	138.0	109.1	106.1	119.2	153.6	206.9
Zr	324	220	1068	255	376	217	85	86	93	237	243
Hf											
La	2.5	1.4	48.1	20.5	43.0	18.4	4.0	6.5	7.5	17.8	19.1
Ce	24.4	42.6	108.2	42.4	106.0	47.5	10.7	11.8	14.7	35.1	46.2
Pr											
Nd	0.0	0.0	60.3	24.7	72.0	28.2	7.4	5.7	10.9	23.5	26.3
Sm											
E.,											

- Eu Gd Tb
- Dy
- Ho
- Er Tm
- Yb
- Lu

Sample	SA3-08	SA3-04	SA3-42	SA3-46	SA3-51	SA3-52	SA3-60	SA7-43	SA7-47	SA7-61	SA7-77
UTM x	361603	340220	336568	341723	345602	346944	345387	345920	345475	365167	345598
UTM y	6598858	6593772	6591640	6598875	6605605	6607002	6605374	6606001	6605499	6599387	6605586
Suite	Grey Gneiss										
SiO2	57.80	66.52	74.99	66.30	51.05	71.36	75.18	67.15	71.39	68.53	49.75
AI2O3	1.47	0.74	0.18	0.60	0.58	0.29	0.22	0.79	0.41	0.38	0.57
Fe2O3	15.02	14.04	12.84	14.99	18.22	14.46	12.64	12.93	12.42	15.03	18.27
TiO2	7.17	4.76	1.77	4.91	7.28	2.84	2.68	8.41	4.57	3.55	7.55
MgO	0.08	0.06	0.01	0.06	0.11	0.03	0.06	0.15	0.06	0.05	0.13
CaO	3.22	2.36	0.16	1.66	6.43	0.74	0.08	0.50	0.29	1.46	6.15
Na2O	4.52	2.89	1.20	2.47	9.23	2.18	1.02	3.05	1.93	3.71	9.57
K2O	3.06	3.19	2.70	3.24	3.05	4.56	4.04	4.19	3.10	3.95	2.75
MnO	4.75	3.90	5.22	4.11	2.09	2.09	3.68	2.29	4.60	1.84	2.31
P2O5	0.65	0.13	0.02	0.12	0.13	0.06	0.01	0.17	0.06	0.08	0.12
LOI	1.28	0.97	0.45	1.22	1.82	0.94	0.25	0.46	0.42	0.80	1.82
Total	99.02	99.56	99.55	99.69	100.00	99.53	99.86	100.08	99.24	99.38	98.99
Ва	3056	418	984	800	513	615	863	426	896	505	532
Co	23.3	81.6	0.0	16.8	85.8	0.0	89.3	12.1	6.7	11.7	32.5
Cr	42.1	6.4	5.5	10.1	4.9	5.9	9.5	bdl	bdl	18.5	94.6
Ga	20.6	31.2	45.7	36.5	16.1	18.4	31.3	23.3	20.0	15.9	15.9
Nb	13.4	29.5	46.1	32.4	15.3	10.4	36.7	12.7	7.6	2.4	1.3
Ni	37.4	21.0	9.8	8.8	3.6	3.6	17.6	bdl	bdl	8.6	32.9
Pb	27.5	231.8	154.1	196.6	101.8	73.7	84.0	13.0	16.2	6.5	5.5
Rb	106	120	305	83	16	762	bdl	95	131	74	94
Sc	13.2	11.3	9.6	11.9	25.4	6.0	6.9	15.5	12.9	8.3	28.7
Sr	1300	215	114	172	523	263	139	140	131	425	478
Та											
Th	5.8	23.3	23.7	17.8	3.6	13.2	13.7	5.9	7.8	4.1	0.0
U	0.9	7.4	3.1	4.6	2.1	3.1	0.5	3.4	2.3	0.9	0.9
V	118.2	59.1	7.3	48.2	147.9	18.7	8.7	12.9	16.3	51.9	163.1
Y	34.3	45.8	57.7	43.0	22.1	21.1	66.4	90.5	41.2	8.6	13.0
Zn	103.7	66.8	11.4	71.0	86.1	32.1	89.2	150.5	71.8	51.0	84.8
Zr	494	203	180	190	53	141	354	353	389	76	36
Hf											
La	65.2	1.3	1.4	0.5	0.0	1.0	1.7	26.7	58.9	27.8	10.4
Ce	140.1	18.0	3.5	16.6	33.1	10.8	3.0	57.8	111.4	48.5	20.9
Pr											
Nd	75.7	25.7	0.0	0.7	33.4	0.0	0.0	33.5	50.2	20.3	12.1
Sm											
Eu											
Gd											

- Tb Dy
- Ho
- Er

Tm

Yb Lu

Sample	SA7-82	SA7-84	SA7-85	SA7-101	SA7-103	SA7-105	SA7-106	SA7-107	SA7-113	SA7-115	SA7-119
UTM x	341789	341721	341511	344525	343752	341998	341576	341576	357352	357232	356737
UTM y	6599190	6598858	6597713	6602581	6601105	6600110	6598030	6598030	6605321	6605241	6605029
Suite	Grey Gneiss										
SiO2	74.61	65.48	64.96	70.44	64.50	70.62	78.37	67.81	66.26	62.34	71.76
AI2O3	0.22	0.56	0.57	0.23	0.66	0.40	0.08	0.49	0.37	0.28	0.41
Fe2O3	12.12	14.96	16.02	14.69	16.17	13.12	11.62	14.87	16.71	12.91	13.53
TiO2	2.16	4.75	4.78	2.82	4.48	4.18	0.64	4.39	3.51	6.86	3.20
MgO	0.04	0.08	0.07	0.03	0.05	0.05	0.01	0.06	0.06	0.12	0.05
CaO	0.22	1.37	1.24	0.66	1.60	0.52	0.15	1.01	1.13	5.26	0.53
Na2O	0.82	3.01	3.28	2.11	2.78	1.63	0.54	2.45	4.08	5.66	1.95
K2O	2.79	3.36	3.60	3.79	3.34	2.93	2.17	3.71	4.32	3.24	3.54
MnO	5.45	4.14	3.68	2.94	3.53	5.20	5.87	3.97	1.47	1.02	4.01
P2O5	0.04	0.12	0.14	0.06	0.19	0.25	0.01	0.11	0.13	0.10	0.11
LOI	0.70	1.03	1.22	1.16	1.47	0.73	0.40	0.94	1.47	1.35	0.60
Total	99.17	98.86	99.58	98.95	98.75	99.63	99.85	99.81	99.50	99.15	99.69
Ba	659	729	807	671	896	1118	792	604	401	282	572
Co	4.2	12.4	10.3	6.9	11.2	6.6	bdl	9.1	8.5	26.6	7.0
Cr	bdl	15.2	2.7	5.0	14.1	bdl	3.6	13.9	3.6	356.6	5.3
Ga	16.1	19.8	21.4	18.3	17.7	17.0	10.9	22.5	17.9	12.8	16.0
Nb	8.4	8.6	10.2	6.0	5.0	10.6	2.5	9.2	2.8	2.1	7.5
Ni	bdl	1.4	bdl	bdl	5.1	bdl	bdl	1.2	bdl	88.4	bdl
Pb	19.9	29.4	17.0	7.1	6.2	18.3	23.9	16.4	8.2	5.2	13.4
Rb	132	157	162	107	122	141	146	174	69	39	136
Sc	5.9	12.1	12.8	7.2	9.7	11.6	2.2	10.6	8.8	23.0	8.2
Sr	84	210	259	438	374	128	105	196	451	278	162
Та											
Th	19.4	11.4	11.2	8.2	0.7	12.2	16.7	8.6	0.3	bdl	9.7
U	2.3	4.1	4.7	2.1	2.1	3.5	2.6	2.6	0.7	0.4	4.5
V	10.4	50.1	42.7	25.8	40.3	17.0	6.5	43.8	50.6	132.6	32.3
Y	45.2	39.4	45.3	17.9	19.3	42.6	12.8	43.4	5.7	12.1	37.7
Zn	29.9	78.1	73.8	33.9	46.2	68.4	12.8	74.4	50.6	83.6	46.6
Zr	260	192	280	110	142	398	148	168	89	65	236
Hf											
La	32.5	31.5	35.2	25.7	10.9	53.0	53.8	29.3	13.3	10.0	29.9
Ce	71.9	65.4	73.7	50.6	16.1	108.0	107.5	58.6	23.6	21.1	63.8
Pr											
Nd	40.7	32.0	37.0	25.8	10.9	47.9	44.6	31.2	14.3	11.8	31.9
Sm											
Eu											

Gd Tb

Dy Ho

Er

Tm

Yb Lu

Sample	SA7-125	SA7-130	SA7-134	SA8-56	SA8-57	SA8-64	SA8-65	SA3-62	SA7-04	SA7-05	SA3-63
UTM x	353964	359894	357715	374291	374291	361852	361852	351175	357114	357489	357478
UTM y	6604112	6596991	6597286	6610312	6610312	6598854	6598854	6613340	6615430	6615470	6615601
Suite	Grey Gneiss	ZMBG	ZMBG	ZMBG	ZMBG						
SiO2	72.71	72.49	61.93	67.14	64.16	74.51	74.28	68.77	70.47	69.70	76.61
AI2O3	0.34	0.47	0.87	0.54	0.68	0.20	0.35	0.30	0.24	0.33	0.21
Fe2O3	13.26	12.76	15.50	14.58	15.34	12.53	11.22	15.96	15.32	14.66	11.62
TiO2	3.08	4.91	4.71	3.28	5.97	2.91	4.33	2.23	2.13	4.00	2.96
MgO	0.06	0.07	0.06	0.05	0.11	0.03	0.07	0.02	0.03	0.07	0.06
CaO	0.39	0.37	2.25	1.84	2.78	bdl	0.11	1.49	0.90	1.04	0.49
Na2O	2.47	1.72	3.19	2.39	2.84	0.39	0.80	3.42	2.67	3.04	2.12
K2O	5.10	4.51	2.95	3.12	3.96	3.33	2.96	4.72	3.51	4.12	3.99
MnO	1.16	1.78	5.73	5.20	2.56	5.32	4.50	1.77	4.18	2.07	1.28
P2O5	0.06	0.12	0.34	0.22	0.13	0.01	0.04	0.09	0.07	0.07	0.02
LOI	0.95	0.28	1.25	0.48	0.48	0.25	0.55	0.81	0.60	0.81	0.54
Total	99.57	99.48	98.79	98.84	99.02	99.49	99.21	99.57	100.13	99.94	99.90
Ba	301	963	2187	1585	268	838	1176	389	716	475	783
Co	6.1	8.7	14.7	9.8	18.3	2.5	5.4	23.1	5.9	9.7	bdl
Cr	15.3	7.6	47.5	48.1	109.7	bdl	bdl	4.0	9.5	0.3	27.3
Ga	16.5	20.1	20.3	17.6	19.4	18.0	13.5	18.6	15.3	15.2	31.4
Nb	2.6	9.4	11.3	9.3	10.2	4.2	2.5	8.2	4.3	9.3	33.0
Ni	bdl	bdl	33.3	34.0	32.6	bdl	bdl	5.2	0.9	bdl	62.6
Pb	15.4	8.0	25.2	33.9	17.9	31.5	17.1	57.7	23.7	8.9	34.6
Rb	52	74	132	159	154	106	79	58	129	65	1142
Sc	6.2	19.1	10.2	8.7	19.0	2.5	6.9	5.4	7.5	11.0	3.1
Sr	183	122	737	1030	315	94	374	442	299	216	134
Та											
Th	6.6	8.3	8.0	10.9	6.3	5.7	7.0	13.2	9.4	5.9	9.6
U	2.7	3.1	0.8	4.1	2.7	1.7	2.2	3.1	5.6	4.1	4.9
V	19.2	23.9	69.8	48.6	98.4	7.3	9.9	21.5	24.0	43.0	3.0
Y	25.0	78.4	29.4	15.5	24.5	54.6	36.6	8.4	11.3	25.4	100.1
Zn	57.9	58.7	73.0	50.2	101.3	92.1	69.3	37.2	36.4	47.0	171.0
Zr	295	325	400	250	144	413	409	141	85	130	290
Hf											
La	12.4	29.8	61.8	47.7	25.2	31.3	34.4	0.2	19.4	16.3	1.0
Ce	26.3	67.5	122.6	86.7	43.9	61.7	66.5	9.4	31.8	32.3	7.2
Pr											
Nd	14.6	42.1	51.7	33.5	24.5	29.5	38.1	16.3	13.7	17.0	0.0
Sm											
Eu											

- Eu Gd Tb
- Dy
- Ho
- Er Tm

Yb

Lu

Sample	SA3-66	SA3-67	SA7-10	SA7-11	SA7-12	SA7-14	SA7-16	SA7-19	SA7-18	SA7-20	SA7-21
UTM x	355182	351678	356818	356816	356817	356692	356522	356274	356274	356274	356274
UTM y	6616561	6614399	6615678	6615678	6615678	6615513	6615595	6615648	6615648	6615648	6615648
Suite	ZMBG										
SiO2	72.28	71.70	78.00	51.32	64.12	47.06	70.36	73.86	70.13	67.74	77.49
Al2O3	0.42	0.23	0.15	1.67	0.86	1.60	0.33	0.15	0.27	0.54	0.09
Fe2O3	13.63	14.55	12.07	13.46	15.16	15.58	15.12	14.41	14.37	14.45	12.04
TiO2	2.69	2.58	1.62	13.13	4.95	12.49	2.77	1.16	2.75	5.06	1.34
MgO	0.02	0.05	0.02	0.19	0.06	0.18	0.03	0.02	0.05	0.07	0.01
CaO	0.36	0.55	bdl	5.12	2.20	7.43	1.11	0.40	0.70	1.75	<0.045
Na2O	1.46	3.52	1.34	9.63	4.49	9.78	2.92	3.12	2.19	2.80	0.40
K2O	2.96	4.76	4.79	2.83	3.30	2.84	3.78	4.66	3.28	3.94	2.44
MnO	5.31	0.79	1.69	1.00	2.75	2.03	2.89	0.90	3.60	2.14	6.37
P2O5	0.07	0.07	0.01	0.19	0.38	0.22	0.10	0.05	0.09	0.10	0.01
LOI	0.39	0.80	0.21	0.99	1.05	0.86	0.43	0.58	1.21	0.53	0.21
Total	99.59	99.60	99.90	99.54	99.32	100.07	99.86	99.32	98.66	99.12	100.39
Ва	800	351	371	150	885	279	621	271	748	309	bdl
Co	bdl	2.6	2.2	45.3	15.7	54.7	7.8	2.9	5.1	14.7	bdl
Cr	1.4	2.1	1.3	122.9	73.0	169.4	33.7	4.9	5.1	95.3	2.1
Ga	51.6	15.6	20.7	22.3	21.6	18.8	16.9	13.6	16.4	25.7	20.0
Nb	48.9	9.8	13.9	4.1	9.4	3.5	4.6	1.8	6.0	14.6	7.3
Ni	20.0	0.6	bdl	22.3	25.7	112.8	6.0	2.0	bdl	17.3	bdl
Pb	336.7	20.4	16.7	12.0	16.3	12.8	16.3	16.3	11.6	14.8	25.2
Rb	49	211	43	40	135	96	127	40	144	112	170
Sc	7.2	5.2	4.7	40.4	11.9	33.2	8.8	5.6	5.7	14.4	1.2
Sr	80	354	159	273	747	385	394	239	239	145	8
Та											
Th	32.6	5.4	18.4	3.8	17.3	0.1	7.8	0.8	10.2	8.5	6.1
U	7.1	2.1	4.0	2.7	4.6	0.7	2.1	1.9	3.7	3.0	2.4
V	20.0	7.7	4.7	331.5	71.0	257.9	38.7	16.2	20.0	79.0	3.1
Y	52.3	15.0	101.5	40.8	23.7	28.4	8.8	27.2	25.9	64.6	17.9
Zn	46.0	36.4	41.6	100.4	65.7	113.7	43.5	16.9	46.9	79.8	48.5
Zr	386	131	196	108	379	125	93	77	162	134	175
Hf											
La	1.4	0.8	46.1	14.9	80.6	9.0	27.1	10.9	21.5	26.7	31.9
Ce	9.2	6.4	97.7	28.6	161.0	20.4	46.8	12.1	38.6	58.7	62.3
Pr											
Nd	0.0	0.0	53.9	13.3	67.7	10.3	21.7	10.2	19.5	35.2	29.2
Sm											
Eu											

Eu Gd Tb

Dy Ho

Er

Tm

Yb Lu

Sample	SA7-22	SA7-23	SA7-24	SA7-27	SA7-109	SA7-136	SA7-138	SA7-140	SA7-141	SA7-142	SA7-143
UTM x	356274	356170	355610	354987	347446	350880	350808	354658	354686	354876	354819
UTM y	6615648	6615549	6616321	6616753	6608199	6617983	6618582	6616673	6616754	6616569	6616681
Suite	ZMBG										
SiO2	67.52	75.48	70.67	73.89	75.69	49.60	48.94	51.64	69.44	69.18	69.35
AI2O3	0.61	0.24	0.30	0.27	0.21	1.00	1.64	1.40	0.30	0.62	0.66
Fe2O3	15.25	11.96	14.80	13.30	11.56	18.67	14.82	16.66	14.65	12.95	13.23
TiO2	4.76	1.77	2.63	1.99	2.74	8.11	12.57	11.36	2.44	5.14	5.74
MgO	0.05	0.02	0.04	0.03	0.06	0.14	0.19	0.15	0.03	0.08	0.09
CaO	1.44	0.31	0.91	0.20	0.12	4.98	6.50	4.16	1.03	0.61	0.67
Na2O	2.62	0.96	2.81	0.96	0.66	7.72	9.64	7.77	2.60	2.41	2.48
K2O	4.47	3.00	4.17	3.15	3.86	3.46	2.52	3.89	3.47	3.62	3.47
MnO	2.22	5.20	2.60	5.61	3.92	2.88	1.13	2.04	4.08	3.68	3.59
P2O5	0.03	0.03	0.08	0.04	0.02	0.22	0.27	0.27	0.08	0.14	0.16
LOI	0.55	0.45	0.35	0.33	0.55	1.95	1.40	0.69	0.44	0.44	0.43
Total	99.53	99.42	99.36	99.76	99.38	98.73	99.62	100.02	98.58	98.88	99.86
Ва	207	235	592	595	625	690	240	447	823	567	686
Co	13.9	3.4	7.5	2.8	5.4	40.6	44.1	36.9	7.7	12.5	12.6
Cr	51.2	0.7	15.7	1.5	9.3	57.1	217.5	21.1	22.2	bdl	bdl
Ga	26.7	16.1	16.5	17.2	17.5	19.4	18.2	20.6	16.4	18.5	18.5
Nb	46.3	14.8	5.0	11.5	9.4	7.4	3.1	7.5	4.1	11.0	12.3
Ni	18.4	1.1	1.6	bdl	bdl	42.3	43.2	4.2	4.3	bdl	bdl
Pb	17.6	25.1	19.1	25.0	13.3	5.6	6.9	12.9	19.3	17.0	13.8
Rb	155	334	91	308	72	88	26	99	120	145	132
Sc	12.8	4.3	8.5	4.5	3.3	26.4	37.8	28.2	7.0	10.7	14.3
Sr	157	37	364	56	69	393	233	318	383	123	142
Та											
Th	26.6	31.7	13.5	24.2	6.5	bdl	1.1	1.8	7.1	11.2	9.4
U	3.7	8.1	3.9	5.9	3.7	1.0	1.6	2.6	2.0	4.9	4.0
V	77.6	17.3	37.2	14.2	10.3	153.5	226.6	159.6	34.3	28.0	30.0
Y	53.7	89.5	11.8	60.1	96.8	61.6	30.8	37.6	9.9	62.1	60.6
Zn	133.7	35.2	38.9	35.9	94.2	81.5	91.3	108.9	41.8	68.1	82.8
Zr	194	160	95	284	387	133	97	155	89	269	306
Hf											
La	52.2	45.8	23.9	42.2	26.2	16.3	8.9	20.9	26.0	36.3	26.3
Ce	112.3	97.1	43.7	93.8	66.0	46.0	22.0	49.1	42.4	75.3	59.4
Pr											
Nd	56.9	49.7	19.6	48.0	42.5	30.6	11.9	23.2	18.2	41.6	35.3
Sm											
Eu											

- Gd
- Tb Dy
- Ho
- Er
- Tm
- Yb
- Lu

Sample	SA3-01a	SA3-01b	SA7-65	SA8-50	SA8-51	SA8-52	SA8-54	MM 02277	MM 026183	ROG 190	ROG 197
UTM x	357948	357948	375658	358960	365238	373897	373298	325424	375014	324908	327033
UTM y	6615161	6615161	6626611	6616661	6623402	6629309	6619421	6526915	6615718	6517359	6518349
Suite	HBG	HBG	HBG	HBG							
SiO2	72.27	72.14	73.23	70.99	75.54	73.20	70.09	72.02	70.59	76.40	77.10
Al2O3	13.34	13.36	12.62	13.37	13.08	13.07	13.72	15.47	13.60	11.90	12.10
Fe2O3	2.61	2.64	3.49	3.02	0.79	1.80	3.15	1.02	3.28	2.67	2.59
TiO2	0.46	0.46	0.36	0.51	0.09	0.27	0.51	0.25	0.55	0.21	0.23
MgO	0.36	0.42	0.28	0.61	bdl	0.24	0.61	0.41	0.55	0.31	0.32
CaO	1.60	1.60	0.81	1.62	0.82	1.26	1.98	1.26	2.07	1.11	1.13
Na2O	3.29	3.29	2.97	3.17	3.81	3.13	3.45	3.54	3.31	2.65	2.65
K2O	5.22	5.19	5.80	4.60	4.90	5.31	4.21	5.78	4.48	4.06	3.99
MnO	0.05	0.05	0.04	0.06	0.03	0.04	0.05	<0.01	0.06	0.04	0.04
P2O5	0.11	0.11	0.04	0.14	0.01	0.07	0.14	0.05	0.15	0.06	0.06
LOI	0.77	0.73	0.52	0.85	0.38	0.49	0.75	0.51	0.35	0.40	0.41
Total	100.06	99.97	100.16	98.95	99.44	98.87	98.66	100.33	98.99	99.80	101.00
Ва	1587	1569	981	1778	86	1628	1359	663	1603	558	171
Co	4	5	32	5	bdl	3	6	bdl	7	bdl	bdl
Cr	bdl	bdl	bdl	bdl	bdl	bdl	4	32	19	11	bdl
Ga	19	19	24	19	21	17	19	16	17	18	19
Nb	19	19	16	19	16	12	16	7.8	14.8	16.1	16.1
Ni	bdl	bdl	bdl	3							
Pb	27	29	15	23	50	26	20	33	19	27	37
Rb	136	138	105	133	369	149	120	232	150	85	223
Sc	7	7	32	9	5	4	9	bdl	bdl	11	6
Sr	240	241	256	307	49	245	317	187	314	126	44
Та								0.2	1.0	0.3	0.3
Th	12	12	5	11	39	11	9	40.2	14.0	42.7	44.9
U								3.8	1.7	4.1	4.4
V	16	15	98	17	4	10	22	14	19	20	9
Y	59	60	90	55	12	33	54	7.7	51.0	96.5	88.3
Zn	68	68	779	85	36	52	75	39	82	78	48
Zr	405	418	569	463	111	220	445	184.4	552.6	203.0	186.6
Hf								6.5	15.2	7.0	6.8
La	90	87	46	99	23	62	85	55.5	140.0	46.3	46.9
Ce	181	181	111	209	40	122	182	119.5	296.1	104.0	106.1
Pr	101	101		200	10	122	102	132	33.5	13.1	13.4
Nd	84	83	59	95	16	56	82	46.4	121.0	57.8	59.3
Sm	0.				10		02	8.8	19.8	16.7	17.2
Eu								0.8	37	0.6	0.5
Gd								5.8	13.5	14.2	14.7
Th								0.0	10	20	20
								21	10.6	170	16.0
Цо								2. <del>4</del> 0.2	1 Q	36	36
F0								0.2	1.0	3.U	3.U
сг Т~								0.5	4.4	9.4 1 1	9.4 1 1
1111 Vh								0.1	0.0	1.1	1.1 5.4
טז ויי								0.4	3.0 0.5	0.7	0.4
LU								0.1	0.5	0.7	0.7
Sample	ROG 200	ROG 203	ROG 245	ROG 275	MM 02105	MM 02214	MM 02247	MM 026182	MM 026199	MM 026255	MM 026302
-----------	------------	------------	------------	------------	-----------------	------------	----------	------------	------------	------------	------------
UTM x	327378	327858	316703	318862	332637	333807	338597	335158	364670	334332	342702
UTM y	6518699	6519377	6531446	6531428	6585303	6539047	6572694	6587408	6544077	6560297	6570573
Suite	HBG	HBG	HBG	HBG	Feda	Feda	Feda	Feda	Feda	Feda	Feda
SiO2	72.00	72.40	68.70	73.40	67.79	72.06	71.15	64.75	66.62	71.34	71.89
AI2O3	13.60	13.70	17.00	13.90	13.54	14.81	13.88	14.48	16.13	13.95	12.68
Fe2O3	2.77	1.96	1.43	1.26	5.05	1.94	2.05	5.81	3.24	1.97	1.43
TiO2	0.36	0.20	0.09	0.17	0.87	0.27	0.40	1.04	0.55	0.25	0.14
MqO	0.36	0.26	0.15	0.22	1.23	0.38	0.87	1.15	1.19	0.36	0.13
CaO	1.56	1.25	1.78	0.94	1.87	1.47	1.46	3.47	2.69	1.13	1.19
Na2O	2.87	2.87	4.63	3.12	3.32	3.39	3.53	3.94	4.21	3.07	2.72
K2O	5.00	5.41	4.28	5.87	4.40	5.73	5.42	3.17	4.43	5.61	5.74
MnO	0.02	0.04	0.08	0.02	0.08	0.02	0.03	0.10	0.05	0.03	0.02
P2O5	0.09	0.05	0.03	0.04	0.34	0.07	0.15	0.42	0.18	0.07	0.03
LOI	0.34	0.48	0.51	0.44	0.98	0.30	0.60	0.86	0.54	0.50	0.66
Total	98.90	98.60	98.70	99.40	99.47	100.43	99.54	99.18	99.82	98.29	96.63
, oran	00100	00.00	00110	00110		100110	00101	00110	00102	00.20	00.00
Ва	428	366	297	320	1453	636	1310	1128	1343	509	588
Co	bdl	bdl	bdl	bdl	8	bdl	bdl	15	8	bdl	5
Cr	bdl	bdl	bdl	bdl	125	24	50	35	28	12	23
Ga	19	18	24	18	17	18	17	19	17	12	bdl
Nb	12.7	9.1	7.6	6.9	17.9	13.1	9.4	19.1	12.8	12.5	9.1
Ni	bdl	bdl	2	bdl	bdl	bdl	9	6	8	7	bdl
Pb	33	39	- 56	65	<10	29	29	20	27	33	28
. ≈ Rb	233	219	210	265	139	306	141	167	136	331	190
Sc	bdl	bdl	bdl	bdl	bdl	bdl	bdl	16	14	bdl	bdl
Sr	84	83	139	115	163	146	664	377	565	114	121
Ta	0.3	02	0.5	02	1 1	0.5	1 1	12	1 1	0.6	0.3
Th	31.8	16.9	34.0	51.5	9.5	60.0	35.8	13.3	16.0	58.2	15.0
	1 9	12	67	12.0	34	6.2	6.0	44	17	25.2	16
v	13	9. 8	bdl	hdl	52	18	30	 64	38	11	-10
v	21.0	62.0	72.4	24.2	52	17.0	16.0	61.9	30 45 1	21.7	16.0
70	52	20	22	24.0	71	20	20	110	67	52	27
211 7r	201.0	159 1	100.2	140 1	122 0	205.2	212 1	196 1	297.0	165.9	107.2
ZI Lif	87	53	3.6	5.6	432.0	6.0	67	13.8	207.9	57	78
	0.7	0.0	5.0	0.0	11.1	0.9	0.7	73.0	0.7	5.7	7.0
la	69.9	49.0	48 0	54 0	65 7	70.8	63.6	86 1	62 0	68.2	737
Ce	148 4	96.4	91.0	99.4	157 1	146.8	118.6	189.3	124.0	144.8	150 1
Pr	17.7	11.4	10.0	11.5	20.0	16.3	11 9	23.3	14.7	16.4	16.2
Nd	73.0	46.2	36.9	45 1	81.5	58.6	38.2	91.3	56.8	60.4	58.3
Sm	16.8	11.3	72	9.5	16.1	9.7	5.5	17.4	11.2	112	9.7
Eu	1.0	0.0	0.8	0.7	3.0	1 1	1.2	35	1.8	0.8	1.0
Gd	12.6	0.3 8.8	53	71	12 4	66	32	13.8	9.4	6.8	52
Th	1.8	1.6	1 1	1 1	20	0.0 0.8	0.5	2 1	15	0.0	0.2
	,.u g o	10.2	,., g o	5.0	11 0	30	27	110	, g o	11	3.1
Dy La	0.Z	25	0.0	0.0	20	3.0 0.6	2.7	22	0.2	4.4 0 0	5.1 0.5
HU E-	1.4	2.0	2.0	0.0	2.U 5.5	1.0	1.4	2.2 5.4	2.0	1.0	1.0
сг Т~	2.0	0.0	9.7	1.9	0.0	1.4	1.4	0.4	3.9 0.6	ι.σ 0.2	1.3
	0.3	1.2	1.9	U.3 1 E	υ. <del>8</del>	U.Z	0.3	U.Ø	0.0	U.Z	0.2
טז ויי	1.3	0.4	13.0	1.0	4.0	1.3	1.0	0.0	3.0 0.5	1.3	1.1
LU	0.2	1.0	∠.3	0.2	0.7	0.2	0.2	υ.Ծ	0.5	0.2	0.2

Sample	MM 026303	MM 026306	MM 99208	ROG 13-1	ROG 15	ROG 16	ROG 218	ROG 23	ROG 256	ROG 257	ROG 27
UTM x	344910	340075	359185	362877	363301	363845	314258	364079	355088	355185	363949
UTM y	6570265	6579722	6480785	6558911	6558756	6558173	6532437	6557117	6586267	6585284	6556165
Suite	Feda	Feda	Feda	Feda	Feda	Feda	Feda	Feda	Feda	Feda	Feda
SiO2	66.17	67.02	62.47	70.28	70.01	70.06	72.50	66.12	66.96	66.88	64.25
AI2O3	14.43	14.70	16.34	14.58	15.17	14.78	14.00	16.28	15.51	15.22	16.40
Fe2O3	5.13	3.93	4.52	3.26	2.68	3.17	1.93	3.01	3.35	3.60	4.06
TiO2	0.65	0.61	0.75	0.43	0.34	0.41	0.22	0.50	0.40	0.50	0.73
MaO	0.60	0.89	1.98	0.53	0.39	0.52	0.30	1.40	0.70	0.73	1.93
CaO	2.20	2.30	3.85	1.49	1.42	1.57	0.94	2.55	2.04	2.36	2.86
Na2O	3.15	3.27	3.90	3.83	3.63	3.72	3.17	4.53	3.84	3.69	4.41
K2O	4.95	4.72	4.47	4.82	5.72	5.10	5.92	3.75	4.85	4.35	4.14
MnO	0.07	0.05	0.07	0.06	0.05	0.06	0.03	0.05	0.06	0.07	0.06
P205	0.28	0.20	0.27	0.09	0.08	0.10	0.06	0.17	0.18	0.21	0.25
LOI	0.63	0.51	0.54	0.34	0.36	0.35	0.51	0.66	0.72	0.83	0.92
Total	98.27	98 21	99.17	99 70	99.86	99.86	99.50	99.01	98.62	98 41	100.00
. otai	00.21	00.21		00110	00100	00.00	00100	00101	00102	00111	100100
Ba	918	1278	1834	716	860	892	482	932	1477	1475	1316
Co	10	7	11	5	6	bdl	bdl	7	7	8	10
Cr	36	27	34	11	26	17	5	38	12	35	69
Ga	14	10	23	20	17	23	22	18	bdl	14	22
Nb	30.7	13.7	14.8	13.7	10.3	13.4	22 0	56	14.6	16.8	12.0
Ni	6	hdl	22	8	7	-5	22.0	17	~5	~5	21
Ph	25	18	26	25	27	21	52	20	21	17	20
Ph	107	162	122	20	27	21	276	120	102	152	157
RD So	107	102	122	ZZZ	201	ZZ I	570	100 hdl	102	100	157
30 Gr	12	295	071	162	124	145	110	651	269	JUI 421	022
	222	200	10	0.7	0.4	0.6	0.6	0.0	1 1	421	000
ть	2.1	19.0	1.0	0.7	0.4	0.0	52.4	10.4	10.1	1.1	17.0
	19.0	10.9	0.5	23.7	20.3	21.3	20.4	10.4	12.1	14.0	17.9
U	2.3	2.3	0.5	2.3	2.4	3.0	20.4	0.9	4.4	3.1	2.1
V	21	43	00	21	10	19	10	42	21	21	57
ř Z.	70.5	40.3	49.3	37.1	30.2	48.2	23.4	15.7	48.8	00.4	23.9
∠n Zn	93	83	76	62	47	58	42	59	78	76	68
Zr	458.8	368.4	296.5	281.9	247.7	273.4	195.7	167.9	321.9	393.0	261.9
Hī	12.4	10.3	8.1	9.4	7.8	8.5	6.7	5.4	8.7	10.7	7.8
	110.1	110.1	10.0	00.7	00.7	50.0	70.0	10.0	01.0	110.0	00.0
La	118.1	110.1	42.6	63.7	60.7	52.8	73.6	46.3	91.3	116.0	69.3
Ce	230.8	224.2	93.7	132.3	127.0	110.3	140.4	88.5	187.9	242.1	135.5
Pr	26.0	25.3	11.7	14.7	14.6	12.5	16.2	9.4	21.7	28.5	14.9
Nd	102.6	94.0	51.5	57.4	52.9	46.6	60.9	34.7	86.0	115.3	54.3
Sm	18.5	14.7	11.8	11.0	10.8	9.3	11.4	5.5	14.6	20.9	8.7
Eu	2.4	2.2	1.7	1.6	1.8	1.7	0.8	1.3	2.6	3.2	1.7
Gd	12.6	8.7	9.3	9.0	8.7	8.0	7.7	3.8	9.6	13.1	5.5
Tb	2.3	1.4	1.4	1.5	1.4	1.4	1.2	0.5	1.6	2.2	0.8
Dy	12.0	7.3	7.9	7.7	7.5	8.7	5.5	3.1	8.3	11.5	4.2
Ho	2.5	1.4	1.6	1.4	1.3	1.8	1.0	0.5	1.7	2.3	0.8
Er	6.6	3.6	4.6	3.4	3.2	4.6	2.3	1.3	4.5	5.9	2.2
Tm	0.9	0.6	0.7	0.5	0.4	0.6	0.3	0.2	0.7	0.9	0.3
Yb	6.0	3.3	4.3	2.4	2.3	3.6	1.4	1.0	4.1	5.0	2.2
Lu	0.8	0.5	0.6	0.3	0.3	0.4	0.2	0.1	0.6	0.7	0.3

Sample	ROG 2A	ROG 34	ROG 43	ROG 71	ROG 72	ROG 75	ROG329	MM 026191	MM 026297	MM 026298	MM 026299
UTM x	378768	363661	366261	373508	376216	380509	327835	362621	361312	361046	360948
UTM y	6544483	6553510	6549586	6546690	6546418	6541581	6540728	6549102	6548784	6548791	6549097
Suite	Feda	Leuco	Leuco	Leuco	Leuco						
SiO2	68.99	65.18	69.42	67.88	67.82	71.64	71.76	72.71	73.40	75.00	73.40
Al2O3	15.46	17.20	15.14	15.82	16.29	14.58	13.63	14.15	13.30	12.70	14.40
Fe2O3	2.48	3.02	2.15	2.13	2.61	1.88	2.56	2.47	2.38	2.03	0.50
TiO2	0.31	0.53	0.37	0.35	0.42	0.29	0.37	0.22	0.23	0.18	0.05
MgO	0.50	1.38	0.90	0.82	0.98	0.66	0.51	0.39	0.28	0.21	0.06
CaO	2.83	2.62	2.09	2.05	2.49	1.18	1.37	1.64	1.41	1.29	0.87
Na2O	4.15	4.56	4.01	4.48	4.68	4.39	3.32	3.54	3.42	3.29	3.02
K2O	4.65	4.61	4.77	4.25	3.98	4.45	4.96	4.55	4.35	4.26	6.63
MnO	0.04	0.05	0.04	0.03	0.04	0.03	0.04	0.02	0.03	0.02	bdl
P2O5	0.10	0.18	0.12	0.13	0.13	0.09	0.10	0.06	0.05	0.03	bdl
LOI	0.72	0.54	0.49	0.61	0.49	0.93	0.56	0.29	0.37	0.21	0.28
Total	100.22	99.85	99.49	98.55	99.93	100.12	99.17	100.03	99.20	99.20	99.20
Ba	1073	1567	1120	1212	1174	950	616	1445	915	598	2500
Co	bdl	9	bdl	5	7	bdl	8	bdl	bdl	bdl	bdl
Cr	19	47	42	31	36	23	20	19	bdl	bdl	bdl
Ga	18	22	16	17	18	15	bdl	15	17	18	13
Nb	6.2	8.4	9.1	6.6	11.1	6.5	14.9	3.3	4.5	3.9	1.3
Ni	6	15	13	11	10	10	bdl	bdl	bdl	bdl	bdl
Pb	34	28	27	24	27	23	22	30	38	36	47
Rb	142	131	132	147	129	157	250	106	96	95	134
Sc	bdl	bdl	10	bdl	11	bdl	bdl	bdl	bdl	bdl	bdl
Sr	657	953	573	617	576	404	143	340	176	105	411
Та	0.6	0.8	1.0	0.6	1.1	0.8	0.6	0.1	0.1	0.1	bdl
Th	20.9	8.6	16.6	15.1	13.2	15.9	42.4	11.2	11.9	17.4	0.3
U	2.1	1.0	1.3	4.0	2.3	1.6	3.0	0.9	0.7	1.1	0.5
V	26	44	26	26	33	23	30	12	7	5	bdl
Y	15.2	17.0	28.1	13.8	28.5	17.1	24.9	9.7	11.8	24.3	0.9
Zn	43	56	50	47	63	45	62	41	34	22	6
Zr	210.0	167.6	150.2	155.5	179.9	147.8	360.3	199.2	183.3	191.8	33.0
Hf	6.9	5.5	4.8	4.7	5.5	4.8	10.5	7.0	6.4	7.9	1.1
La	53.7	40.3	50.3	43.6	50.5	43.6	83.9	43.2	45.6	43.0	3.0
Ce	97.0	86.0	87.0	85.0	98.5	78.0	158.1	84.8	91.5	86.3	5.1
Pr	9.7	9.9	9.0	9.0	10.7	7.9	18.2	10.3	11.0	10.6	0.5
Nd	33.1	36.6	33.3	32.4	40.5	27.9	70.6	37.9	47.2	44.7	1.8
Sm	5.1	5.9	5.9	5.3	6.8	4.4	11.7	7.0	9.1	10.6	0.3
Eu	1.0	1.5	1.1	1.1	1.3	1.0	1.2	1.2	1.3	1.3	1.0
Gd	3.4	3.8	4.3	3.3	4.8	3.0	8.1	4.4	6.3	8.5	0.3
ID	0.5	0.6	0.8	0.5	0.8	0.5	1.1	0.6	0.8	1.4	bdl
Dy	2.4	3.0	4.4	2.5	4.1	2.8	5.0	2.4	3.3	6.4	bdl
Ho	0.5	0.6	0.9	0.4	0.9	0.5	0.9	0.4	0.5	1.0	bdl
Er T	1.3	1.5	2.6	1.2	2.8	1.7	2.2	0.8	1.1	2.3	Ddl
i m	0.2	0.2	0.4	0.2	0.5	0.3	0.3	0.1	0.1	0.2	DCI
Ϋ́Ď	1.2	1.5	2.0	1.1	3.2	1.7	2.0	0.6	0.0	1.3	DCI
Lu	0.2	0.2	0.4	0.2	0.5	0.2	0.3	0.1	0.1	0.2	IDa

Sample	ROG 28	ROG 30-1	ROG 33	ROG 45	SA8-23a	SA8-23b
UTM x	363525	364734	364407	366293	372344	372344
UTM y	6555933	6551294	6552651	6549215	6636570	6636570
Suite	Leuco	Leuco	Leuco	Leuco	Dyrskard	Dyrskard
SiO2	71.87	76.85	73.17	74.50	76.13	75.99
Al2O3	13.77	11.69	14.46	13.45	11.86	11.84
Fe2O3	1.61	1.56	0.55	1.13	2.12	2.12
TiO2	0.28	0.18	0.07	0.16	0.20	0.20
MgO	0.71	0.50	0.13	0.32	0.11	0.08
CaO	1.50	0.45	1.20	1.16	0.45	0.44
Na2O	3.63	2.26	4.77	3.83	3.45	3.48
K2O	5.19	6.28	4.05	4.59	4.99	5.18
MnO	0.02	0.03	0.01	0.03	0.23	0.02
P2O5	0.09	0.04	0.02	0.04	0.01	0.01
LOI	0.75	0.21	0.27	0.28	0.24	0.23
Total	99.41	100.05	98.69	99.50	99.79	99.59
Ва	1507	1117	484	467	344	347
Co	bdl	bdl	bdl	bdl	1.7	1.6
Cr	27	18	10	13	bdl	bdl
Ga	14	12	13	17	19.0	19.1
Nb	5.1	4.0	1.3	4.5	14.0	14.0
Ni	10	6	5	8	bdl	bdl
Pb	17	44	38	30	8.1	8.7
Rb	154	167	105	138	144	145
Sc	bdl	bdl	bdl	bdl	2.4	3.0
Sr	550	268	166	325	43	44
Та	1.0	0.1	bdl	0.5		
Th	7.9	15.7	5.4	8.2	9.2	9.6
U	1.6	2.0	2.5	1.1	4.2	4.5
V	28	bdl	bdl	11	6.7	5.4
Y	11.9	44.7	33.5	18.6	110	112
Zn	35	33	17	32	24.9	25.4
Zr	136.6	194.3	61.5	82.4	379	388
Hf	4.5	8.1	2.3	3.6		
La	34.6	33.3	10.4	23.8	36.5	36.2
Ce	65.5	73.6	21.0	38.5	90.8	89.0
Pr	6.8	9.2	2.5	3.8		
Nd	25.2	37.4	9.3	13.9	54.3	56.1
Sm	3.8	8.4	2.3	2.6		
Eu	0.9	1.1	0.9	0.5		
Gd	2.5	8.0	2.7	2.5		
Tb	0.4	1.3	0.6	0.5		<b></b>
Dy	2.1	7.5	4.1	2.8		Table 10
Ho	0.4	1.6	1.0	0.6		Hornblend
Er	1.0	4.3	3.5	1.8		Suite, Gre
Tm	0.2	0.6	0.6	0.3		= Zinc M
Yb	1.1	4.1	3.4	1.5		Suite. Dat
Lu	0.2	0.6	0.6	0.2		bdl = belo



	Date	Zrn	۳	204	206Pb	207Pb	238U	Po	∍	207Pb/	1a %	207Pb/	1o %	206Pb/	1a %	Rho	207Pb/	2α	207Pb/	2σ	206Pb/	2σ	Disc.
				cps	٣٧	٣V	٣٧	bpm	ppm	206Pb		235U		238U			206Pb		235U		238U		
SA3-01 3	.11.09	15	R CA	-163	1.80	0.11	8.75	6	57	0.0737	0.903	1.712	1.956	0.168	1.735	0.89	1034	36	1013	25	1003	32	2.96
SA3-01 3	.11.09	33	R CA	-290	4.24	0.26	20.42	21	134	0.0738	0.432	1.709	2.195	0.168	2.152	0.98	1037	17	1012	28	1000	40	3.55
SA3-01 3	.11.09	17	R CA	-25	11.40	0.72	53.97	55	353	0.0741	0.400	1.747	1.752	0.171	1.705	0.97	1045	16	1026	22	1017	32	2.73
SA3-01 3	.11.09	13	R CA	-303	5.65	0.35	25.42	27	166	0.0737	0.400	1.754	1.773	0.173	1.727	0.97	1033	16	1029	23	1026	33	0.62
SA3-01 3	.11.09	5	R CA	145	11.16	0.70	53.44	54	350	0.0739	0.400	1.703	1.697	0.167	1.649	0.97	1039	16	1010	21	966	30	4.12
SA3-01 3	.11.09	4	R CA	17	6.67	0.42	32.39	32	212	0.0737	0.400	1.684	1.685	0.166	1.637	0.97	1033	16	1002	21	988	30	4.31
SA3-01 3	.11.09	12	R CA	169	1.67	0.10	8.14	8	53	0.0737	0.923	1.675	1.972	0.165	1.743	0.88	1032	37	666	25	984	32	4.66
SA3-01 2	2.4.08	7	R CA	156	2.30	0.15	13.75	45	279	0.0738	0.669	1.773	1.190	0.174	0.985	0.83	1037	27	1036	15	1035	19	0.11
SA3-01 2	2.4.08	14	R CA	165	1.10	0.07	6.64	21	135	0.0737	1.254	1.753	1.585	0.173	0.969	0.61	1032	51	1028	20	1027	18	0.57
SA3-01 2	2.4.08	5	R CA	-130	5.97	0.39	35.84	116	727	0.0740	0.500	1.775	1.096	0.174	0.975	0.89	1041	20	1036	14	1034	19	0.74
SA3-01 2	2.4.08	7	R CA	133	1.88	0.12	11.38	36	231	0.0738	0.794	1.766	1.249	0.174	0.964	0.77	1035	32	1033	16	1033	18	0.21
SA3-01 2	2.4.08	24	R CA	134	5.32	0.35	32.40	103	657	0.0741	0.500	1.779	1.084	0.174	0.962	0.89	1045	20	1038	14	1034	18	1.05
SA3-01 2	2.4.08	29	R CA	355	2.43	0.16	14.60	47	296	0.0743	0.650	1.799	1.164	0.176	0.966	0.83	1048	26	1045	15	1043	19	0.47
SA3-01 2	2.4.08	19	R CA	199	0.76	0.05	4.63	15	94	0.0737	1.770	1.786	2.018	0.176	0.971	0.48	1033	72	1040	26	1044	19	-1.03
SA3-01 2	2.4.08	22	R CA	-106	0.72	0.05	4.34	14	88	0.0732	1.827	1.783	2.099	0.177	1.032	0.49	1018	74	1039	27	1049	20	-3.03
SA3-01 2	2.4.08	30	R CA	-124	0.75	0.05	4.64	15	94	0.0741	1.773	1.793	2.026	0.176	0.981	0.48	1044	72	1043	26	1043	19	0.13
SA3-01 2	2.4.08	38	R CA	-120	2.89	0.19	17.85	56	362	0.0743	0.547	1.799	1.105	0.176	096.0	0.87	1050	22	1045	14	1043	18	0.65
SA3-01 2	2.4.08	45	R CA	-101	0.69	0.04	4.29	13	87	0.0738	1.953	1.775	2.197	0.174	1.007	0.46	1035	79	1036	28	1037	19	-0.13
SA3-01 2	2.4.08	<del>16</del>	R CA	<del>113</del>	0.26	<u>0.02</u>	<del>1.51</del>	¢	<del>31</del>	0.0720	4.660	<del>1.743</del>	4.772	0.176	1.029	0.22	<del>986</del>	<del>190</del>	1024	60	1043	20	-5.75
SA3-01 2	2.4.08	<del>1</del> 8	R CA	<del>66</del> -	0.62	<u>0.04</u>	<del>3.74</del>	<del>1</del> 2	<del>76</del>	0.0735	2.107	<del>1.726</del>	2.341	0.170	1.020	0.44	<del>1028</del>	85	<del>1018</del>	30	<del>1014</del>	<del>1</del> 9	<del>1.34</del>
SA3-01 2	2.4.08	<del>1</del> 0	R CA	7	0:50	0.03	<u>2.96</u>	<del>1</del> 0	<del>0</del> 9	0.0724	2.577	<del>1.768</del>	2.762	0.177	0.995	<del>0.36</del>	<del>266</del>	<del>105</del>	1034	35	1052	<del>1</del> 9	-5.50
SA3-01 2	2.4.08	<del>10</del>	R CA	136	<del>0.62</del>	0.04	<del>3.80</del>	4	#	0.0738	<u>2.093</u>	<del>1.765</del>	2.314	0.174	<del>0.987</del>	0.43	1035	<del>85</del>	1033	30	1032	<del>0</del>	0:30
SA3-02 1	4.5.09	-	RU	141	5.58	0.48	19.26	119	468	0.0945	0.350	3.460	1.304	0.266	1.256	0.96	1518	13	1518	20	1518	34	-0.02
SA3-02 1	4.5.09	2	RU	-145	5.14	0.44	17.23	110	419	0.0951	0.350	3.553	2.086	0.271	2.057	0.99	1531	13	1539	33	1545	56	-0.91
SA3-02 1	4.5.09	e	RU	-184	5.87	0.51	19.98	126	486	0.0949	0.350	3.502	1.107	0.268	1.050	0.95	1526	13	1528	17	1529	29	-0.19
SA3-02 1	4.5.09	4	RU	-148	6.83	0.59	23.21	146	564	0.0946	0.350	3.470	1.548	0.266	1.508	0.97	1519	13	1520	24	1521	41	-0.11
SA3-02 1	4.5.09	5	RU	-109	5.90	0.51	20.02	126	487	0.0945	0.350	3.513	1.471	0.270	1.429	0.97	1519	13	1530	23	1538	39	-1.28
SA3-02 1	4.5.09	7	RU	-217	3.99	0.34	13.62	85	331	0.0942	0.350	3.439	1.585	0.265	1.546	0.98	1512	13	1513	25	1515	42	-0.19
SA3-02 1	4.5.09	8	RU	-176	4.60	0.40	15.30	98	372	0.0946	0.350	3.554	1.616	0.272	1.578	0.98	1521	13	1539	25	1553	43	-2.13
SA3-02 1	4.5.09	10	R CA	-263	4.76	0.41	16.07	102	391	0.0940	0.350	3.496	1.078	0.270	1.020	0.95	1509	13	1526	17	1539	28	-1.97

| Pb/ 2σ Disc.<br>8U | 88 42 -4.45 | 35 27 -1.42 |            | 54 27 -2.82                    | 54 27 -2.82<br>38 24 -2.02                | 54 27 -2.82<br>38 24 -2.02<br>35 24 -1.24            | 54         27         -2.82           38         24         -2.02           35         24         -1.24           30         29         -1.43 | 54         27         -2.82           :38         24         -2.02           :35         24         -1.24           :30         29         -1.43           :41         24         -2.33 | 54     27     -2.82       38     24     -2.02       35     24     -1.24       30     29     -1.43       41     24     -2.33       36     24     -1.21 | 54     27     -2.82       38     24     -2.02       35     24     -1.24       30     29     -1.43       41     24     -2.33       36     24     -1.21       36     24     -1.23       36     24     -1.21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 54     27     -2.82       :38     24     -2.02       :35     24     -1.24       :30     29     -1.43       :41     24     -2.33       :36     24     -1.21       :36     24     -1.21       :36     24     -1.21       :36     24     -1.21       :07     25     -0.16       :20     25     -0.16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 54     27     -2.82       38     24     -2.02       35     24     -1.24       30     29     -1.43       41     24     -2.33       36     24     -1.21       36     24     -1.21       37     25     -0.16       27     25     -0.41       27     25     -0.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 54     27     -2.82       38     24     -2.02       35     24     -1.24       30     29     -1.43       36     24     -1.21       36     24     -1.21       36     24     -1.21       36     24     -1.21       36     24     -1.21       37     25     -0.16       37     25     -0.41       38     25     -0.28       39     25     -0.28       30     25     2.84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 54     27     -2.82       38     24     -2.02       35     24     -1.24       30     29     -1.43       31     24     -2.33       36     24     -1.21       37     25     -0.16       37     25     -0.16       38     25     -0.41       39     25     -0.41       31     25     2.8       32     25     2.84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     29     -1.43       36     24     -1.23       36     24     -1.21       36     24     -1.21       36     24     -1.21       36     24     -1.21       37     25     -0.41       28     25     -0.41       29     25     -0.41       21     25     0.28       41     25     0.28       41     25     0.28       41     25     0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.21       36     24     -1.21       36     24     -1.21       36     24     -1.21       37     25     -0.41       28     25     -0.41       29     25     -0.28       31     25     0.28       31     25     0.28       32     25     2.84       31     25     0.00       32     26     -0.04       33     26     -0.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 154     27     -2.82       138     24     -2.02       135     24     -1.24       136     24     -1.24       141     24     -2.33       136     24     -1.21       136     24     -1.21       136     24     -1.21       13     25     -0.16       13     25     -0.16       13     26     -0.28       13     26     -0.04       13     26     -0.03       13     26     -0.38       23     25     2.84       13     26     -0.38       23     25     2.84       13     26     -0.38       23     25     2.84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.21       36     24     -1.21       37     25     -0.41       28     25     -0.41       29     25     -0.41       21     25     -0.41       23     25     -0.41       21     25     0.28       41     25     0.28       43     25     2.84       43     25     -0.41       24     1.21     25       25     2.84       43     25     -0.41       26     -0.38       43     25     -0.41       25     2.84       43     25     -0.41       26     -0.38       27     25     -0.41       28     26     -0.38       29     25     -1.13       21     25     -0.76       23     25     -1.13       23     25     -1.13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.21       36     24     -1.21       36     24     -1.21       37     25     -0.41       28     25     -0.41       29     25     -0.41       21     25     0.28       63     25     2.84       63     25     2.84       63     25     2.84       63     25     2.84       63     25     2.84       63     25     2.84       63     25     2.84       71     25     0.00       73     26     -0.04       73     25     -0.76       73     25     -0.76       73     25     -0.76       73     26     -0.76       73     26     -0.76                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 154     27     -2.82       138     24     -2.02       135     24     -1.24       136     24     -1.24       136     24     -1.24       136     24     -1.24       136     24     -1.24       136     24     -1.21       137     25     -0.16       13     25     -0.44       14     25     -0.28       151     25     -0.44       161     25     -0.44       171     25     0.00       173     26     -0.38       173     26     -0.38       173     26     -0.38       174     25     0.00       175     26     -0.38       176     25     -0.04       177     25     -0.08       178     26     -0.08       178     26     -0.08       179     26     -0.08       171     25     -0.06       178     26     -0.08       178     26     -0.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     29     -1.43       36     29     -1.24       37     25     -0.16       36     24     -1.21       37     25     -0.41       26     25     -0.41       27     25     -0.41       28     25     -0.41       29     25     -0.41       21     25     0.00       31     25     0.04       32     25     -0.41       33     25     -0.41       34     25     0.00       35     2.84     -0.64       36     25     -0.76       37     25     -0.41       38     25     -0.41       39     26     -0.88       31     25     -0.76       32     26     -0.77       38     26     -0.77       38     26     -0.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.21       37     25     -0.41       26     25     -0.41       27     25     -0.41       28     25     -0.41       29     25     -0.41       21     25     -0.28       33     25     -0.41       33     26     -0.04       33     25     -0.41       33     26     -0.03       33     25     -1.13       33     26     -0.04       33     26     -0.38       33     26     -0.38       33     26     -0.38       33     26     -0.38       33     26     -0.38       34     26     -0.77       35     16     15.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.23       36     24     -1.23       36     24     -1.23       36     24     -1.23       37     25     -0.46       28     25     -0.41       29     25     -0.41       21     25     0.28       63     25     -0.41       23     25     2.84       13     26     -0.38       13     26     -0.38       14     25     0.00       17     25     0.04       17     25     -0.75       17     26     -0.77       17     54     8.87       17     54     8.87       17     54     8.87       167     15.40     -0.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 54     27     -2.82       38     24     -2.02       36     24     -1.24       36     24     -1.24       36     24     -1.21       36     24     -1.21       36     24     -1.21       36     24     -1.21       36     24     -1.21       36     25     -0.16       37     25     -0.16       38     25     2.84       41     25     0.00       13     26     -0.28       13     26     -0.38       13     26     -0.38       13     26     -0.38       13     26     -0.38       13     26     -0.38       14     26     -0.38       17     54     8.87       21     54     -0.77       23     36     -0.77       24     444     454       25     36     11.71                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.21       27     25     -0.46       26     25     -0.41       27     25     -0.41       28     25     -0.41       29     25     -0.41       21     25     -0.28       23     25     -0.41       23     25     -0.41       24     1.21     25       27     25     -0.28       28     25     -0.41       29     26     -0.04       21     25     -0.41       23     25     -1.13       23     25     -0.41       24     44     434       25     -0.77       26     -0.88       27     58       28     15.40       29     36       21     58       26     36       27     58       28     36       29     36       21     58       28     36       29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.24       36     24     -1.24       37     25     -0.46       36     24     -1.21       37     25     -0.46       38     25     -0.41       39     25     -0.41       21     25     0.00       31     25     0.00       32     25     2.84       33     25     -1.13       33     25     -0.16       33     25     -1.13       33     25     -1.13       34     35     15.40       35     15.40     15.40       36     11.71     25       36     36     11.71       36     36     11.71       37     53     28.05       38     2.38     28.05       39     36     11.71                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.24       36     24     -1.24       36     24     -1.21       36     25     -0.46       27     25     -0.46       28     25     -0.44       29     25     -0.44       21     25     -0.28       41     25     0.00       71     25     -0.04       73     26     -0.38       73     25     -1.13       73     26     -0.38       73     26     -0.38       74     13     56       74     134     56       74     134     56       73     26     -0.77       28     36     11.71       29     36     11.71       29     36     11.71       29     36     22.80       60     36     22.80       61     36     22.80       62     36     11.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 54     27     -2.82       38     24     -2.02       35     24     -1.24       36     24     -1.24       36     24     -1.23       36     24     -1.23       36     24     -1.23       37     25     -0.46       26     25     -0.41       27     25     -0.41       28     25     -0.41       29     25     -0.41       21     25     -0.28       23     25     -0.41       24     1.21     25       27     25     -0.28       23     25     -0.41       24     25     -0.28       23     25     -0.41       24     25     -0.28       23     25     -0.41       24     26     -0.27       23     25     -0.41       23     26     -0.38       23     25     -0.41       24     26     -0.77       25     26     -0.77       26     27     88       27     28     28.05       28     27     38       29     27     28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|--------------------|-------------|-------------|------------|--------------------------------|-------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|---------|---------|---------|--------------------|-------------------------------|------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|---------|--|---------|--------------------|-------------------------------|------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------|--------|--|--------|------------------|----------------------------|--------------------------------------|------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2σ 20€<br>23       | 24 15       | 1           | GL / L     | 11 15<br>16 15                 | 10 15 15 15 15                            |                                                      | 1/ 15<br>16 15<br>15 15<br>15 15<br>15 15<br>18 15                                                                                            | 1 15 15 15 15 15 15 15 15 15 15 15 15 15                                                                                                                                                |                                                                                                                                                       | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10 15 15 15 15 15 15 15 15 15 15 15 15 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1 16 15 15 15 15 15 15 15 15 15 15 15 15 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10 15 15 15 15 15 15 15 15 15 15 15 15 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10 15 15 15 15 15 15 15 15 15 15 15 15 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 10 15 15 15 15 15 15 15 15 15 15 15 15 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1     
 1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td></td></td></td></td></td></td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1     
 1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td></td></td></td></td></td></td> | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td></td></td></td></td></td> | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1  
  1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td></td></td></td></td> | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 
     1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td></td></td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td></td></td> | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1
    1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td><td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td></td> | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1
      1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td> <td>1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| 207 PD/            | 1559        |             | 1526       | 1526<br>1536                   | 1526<br>1536<br>1525                      | 1526<br>1536<br>1525<br>1527                         | 1526<br>1536<br>1525<br>1527<br>1527                                                                                                          | 1526<br>1536<br>1525<br>1527<br>1521<br>1521                                                                                                                                            | 1526<br>1536<br>1525<br>1527<br>1521<br>1521<br>1528                                                                                                  | 1526<br>1536<br>1527<br>1527<br>1527<br>1528<br>1528                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1526<br>1536<br>1525<br>1527<br>1527<br>1528<br>1528<br>1506<br>1518                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1526<br>1536<br>1525<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1526<br>1536<br>1525<br>1527<br>1527<br>1528<br>1528<br>1506<br>1528<br>1518<br>1522                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1526<br>1526<br>1525<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1518<br>1511                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1527<br>1528<br>1518<br>1518<br>1513                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 1526<br>1536<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1513<br>1513                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1526<br>1536<br>1527<br>1527<br>1527<br>1528<br>1518<br>1518<br>1518<br>1513<br>1513<br>1516                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1526<br>1526<br>1525<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1513<br>1518<br>1516<br>1516                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1518<br>1518<br>1516<br>1516<br>1516                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1526<br>1526<br>1527<br>1527<br>1527<br>1528<br>1518<br>1518<br>1518<br>1513<br>1518<br>1513<br>1508<br>1516<br>1516<br>1516<br>1516<br>1516                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1513<br>1513<br>1516<br>1516<br>1516<br>1516<br>1517<br>1508                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1518<br>1516<br>1516<br>1516<br>1516<br>151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1526<br>1526<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1513<br>1516<br>1513<br>1516<br>1516<br>1516<br>1516<br>1517<br>1508<br>1517<br>1508<br>1517<br>1508<br>1517<br>1508<br>1517<br>1508<br>1517<br>1508<br>1517<br>1508<br>1517<br>1528<br>1528<br>1528<br>1528<br>1528<br>1528<br>1528<br>1528                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1513<br>1518<br>1516<br>1516<br>1516<br>1516<br>1516<br>1516<br>1516                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1518<br>1516<br>1516<br>1516<br>1516<br>151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1518<br>1516<br>1516<br>1516<br>1516<br>151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1528<br>1528<br>1518<br>1518<br>1518<br>1518<br>1516<br>1516<br>1516<br>151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1526<br>1526<br>1527<br>1527<br>1527<br>1527<br>1527<br>1528<br>1516<br>1511<br>1518<br>1516<br>1516<br>1516<br>1516<br>151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| ²b/ 2₀<br>²b       | 20 13       |             | 14 13      | 4 13<br>12 13                  | 4 13<br>2 13<br>38 16                     | 4 13<br>2 13<br>38 16<br>15                          | 4 13<br>2 13<br>38 16<br>16 15<br>38 14                                                                                                       | 4 13<br>2 13<br>38 16<br>15<br>38 14<br>38 14<br>36 13                                                                                                                                  | 4 13<br>2 13<br>8 16<br>8 15<br>8 14<br>8 14<br>8 13<br>8 14                                                                                          | 2 2 13<br>2 13<br>3 16<br>3 15<br>3 15<br>1 1<br>2 13<br>2 13 | 4 4 13 2 13 16 6 6 15 13 16 15 15 15 15 15 15 15 15 15 15 15 15 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4     4       2     13       08     16       08     15       08     14       08     13       08     14       13     13       05     24       14     19       15     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4     4       2     2       8     6       6     15       8     14       8     14       9     13       14     13       15     24       16     13       17     19       16     19       17     19       19     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4     4       2     13       8     16       6     15       18     14       19     13       19     14       19     19       10     19       11     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4     4       2     2       8     6       15     8       16     13       16     13       17     19       19     19       10     19       11     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4     4       2     2       8     8       8     8       7     13       7     13       7     13       7     13       7     14       10     13       11     19       12     19       13     19       14     19       15     19       16     19       17     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4     4       2     2       8     6       6     15       8     14       13     14       14     19       15     19       16     19       17     19       19     19       10     19       11     19       12     19       13     19       14     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4     4       8     8       8     8       15     8       15     14       16     14       17     19       16     19       17     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                      | 4     4       8     8       8     8       8     8       8     14       13     14       14     15       15     19       16     19       17     19       19     19       19     19       19     19       19     19       10     19       11     19       12     19       13     19       14     19       15     19       16     19       17     19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4     4       8     8       8     8       8     8       10     10       11     10       12     10       13     10       14     10       15     10       16     10       17     10       19     10       10     10       10     10       10     10       10     10       10     10       10     10       10     10       10     10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4     4       8     6       8     8       8     8       8     7       9     8       10     10       11     10       12     10       13     10       14     10       15     10       16     10       17     10       19     10       10     10       10     10       10     10       10     10       10     10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4     4       8     6       8     6       13     14       13     14       14     15       15     15       16     16       17     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       19     19       10     19       10     19       10     19       10     19       10     19       10     19       10     19       10     19       10     10       10     10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4     8     8     8     8     8     13       6     7     7     7     10     10       7     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10     10       10     10     10     10     10       10     10     10     10     10       10     10     10     10     10       10     10     10     10     10       10     10     10     10     10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4     4       6     6       6     6       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       7     7       8     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9     7       9 <th>4     8     8     8     8     8     8     13       6     6     7     7     13     14     13       7     7     7     15     19     19       9     9     9     19     19     19       9     19     19     19     19     19       10     19     19     19     19       11     19     19     19     19       12     19     19     19     19       13     19     19     19     19       14     19     19     19     19       15     19     19     19     19       16     19     19     19     19       17     19     19     19     19       16     19     19     19     10       17     10     10     10     10       16     10     10     10     10       17     10     10     10     10       17     10     10     10     10       17     10     10     10     10       17     10     10     10     10       10     10&lt;</th> <th>4       8       8       8       8       8       8       8       13         6       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</th> <th>4       8       8       8       8       8       8       8       8       13       13         6       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1<th>4       4       8       8       8       8       8       8       8       8       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1      
1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</th></th>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4     8     8     8     8     8     8     13       6     6     7     7     13     14     13       7     7     7     15     19     19       9     9     9     19     19     19       9     19     19     19     19     19       10     19     19     19     19       11     19     19     19     19       12     19     19     19     19       13     19     19     19     19       14     19     19     19     19       15     19     19     19     19       16     19     19     19     19       17     19     19     19     19       16     19     19     19     10       17     10     10     10     10       16     10     10     10     10       17     10     10     10     10       17     10     10     10     10       17     10     10     10     10       17     10     10     10     10       10     10<                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4       8       8       8       8       8       8       8       13         6       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4       8       8       8       8       8       8       8       8       13       13         6       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 <th>4       4       8       8       8       8       8       8       8       8       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1</th> | 4       4       8       8       8       8       8       8       8       8       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                 
                                                      |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| 206P               | 97 1520     |             | 94 1514    | 94 151 <sup>2</sup><br>94 1512 | 94 151 <sup>4</sup><br>94 1512<br>90 1508 | 94 151 <sup>4</sup><br>94 1512<br>90 1508<br>91 1516 | 94 151 <sup>4</sup><br>94 1512<br>90 1508<br>91 1516<br>94 1508                                                                               | 94 151 <sup>4</sup><br>94 1512<br>90 1508<br>91 1516<br>94 1508<br>93 1508                                                                                                              | <ol> <li>94 1514</li> <li>94 1515</li> <li>90 1508</li> <li>91 1516</li> <li>94 1508</li> <li>93 1508</li> <li>93 1518</li> <li>93 1518</li> </ol>    | 94 1514<br>94 1515<br>90 1506<br>91 1516<br>94 1506<br>93 1506<br>93 1516<br>83 1508                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul> <li>94 1514</li> <li>94 1515</li> <li>90 1506</li> <li>91 1516</li> <li>94 1506</li> <li>93 1507</li> <li>93 1516</li> <li>93 1516</li> <li>83 1506</li> <li>88 1514</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ol> <li>94 151.</li> <li>94 151.</li> <li>99 150.</li> <li>91 151.</li> <li>94 150.</li> <li>93 150.</li> <li>93 151.</li> <li>83 150.</li> <li>88 151.</li> <li>88 151.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <ul> <li>94 1514</li> <li>94 1515</li> <li>90 1506</li> <li>91 1516</li> <li>93 1506</li> <li>93 1516</li> <li>93 1515</li> <li>83 1516</li> <li>88 1516</li> <li>88 1526</li> <li>88 1526</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul> <li>94 1514</li> <li>94 1515</li> <li>99 1515</li> <li>91 1516</li> <li>93 1506</li> <li>93 1516</li> <li>93 1516</li> <li>83 1516</li> <li>88 1514</li> <li>88 1524</li> <li>88 1524</li> <li>88 1524</li> <li>88 1524</li> <li>88 1524</li> <li>88 1554</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 94     1514       94     1515       99     1515       91     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       83     1517       88     1514       88     1516       88     1516       88     1517       88     1517       88     1517       88     1517                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul> <li>94 151.</li> <li>94 151.</li> <li>99 150.</li> <li>91 151.</li> <li>93 150.</li> <li>93 151.</li> <li>93 151.</li> <li>83 151.</li> <li>88 152.</li> <li>88 152.</li> <li>88 151.</li> <li>88 152.</li> <li>88 151.</li> <li>88 152.</li> <li>88 151.</li> <li>88 151.</li>
<li>88 151.</li> <li>88 151.</li> <li>88 151.</li> <li>88 151.</li> <li>88 152.</li> <li>88 155.</li> <li>151.</li> <l< td=""><td><ol> <li>94 151.</li> <li>94 151.</li> <li>94 151.</li> <li>94 151.</li> <li>94 151.</li> <li>94 150.</li> <li>93 151.</li> <li>93 151.</li> <li>83 151.</li> <li>88 151.</li> <li>99 150.</li> <li>90 150.</li> <li>90 150.</li> </ol></td><td>94     1514       94     1515       94     1515       94     1515       94     1516       93     1516       93     1516       93     1516       83     1516       88     1517       88     1517       88     1516       88     1516       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517</td><td>94     151.       94     151.       94     151.       91     151.       94     151.       94     151.       93     150.       93     151.       93     151.       93     151.       83     150.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     150.       88     150.       88     150.       88     150.       88     150.       88     150.       88     150.       88     150.</td><td>94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     150,       93     151,       93     151,       93     151,       93     151,       93     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       89     151,       89     151,       89     151,       89     150,       89     150,       89     150,       89     150,       89     150,       89     150,       89     150,       89     150,</td><td>94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     150,       93     151,       93     151,       83     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       89     151,       89     151,       89     151,       89     151,       89     151,       89     151,       89     151,       91,     150,       82     150,       83     150,       83     150,       83     150,       83     150,       83     150,       83     150,       84     150,       85     150,       86     150,</td><td>94     151.       94     151.       94     151.       94     151.       94     151.       94     151.       93     1516.       93     1516.       93     1516.       93     1516.       93     1516.       93     1516.       98     1514.       88     1514.       88     1514.       88     1514.       88     1517.       88     1517.       88     1517.       88     1517.       89     1517.       89     1517.       93     1516.       93     1517.       93     1516.       93     1517.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.</td><td>94     151.       94     1516       94     1515       94     1516       94     1516       94     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       98     1524       88     1524       88     1517       88     1516       88     1517       88     1516       88     1517       88     1516       88     1517       88     1516       88     1517       88     1516       88     1517       88     1517       93     1516       93     1517       93     1507       93     1507       93     1507       93     1507       93     1507       93     1475</td><td>94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     150,       93     151,       93     151,       93     150,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       89     151,       90     151,       91     150,       92     150,       93     150,       94     150,       95     150,       96     150,       97     155,       93     150,       94     150,       95     150,       93     150,       94     150,       95     150,       93     150,       94     150,       95     150,       96     147,       97     150,</td><td>94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     1516,       93     1516,       93     1516,       83     1516,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       93     151,       93     151,       93     151,       93     151,       93     150,       93     150,       93     150,       93     150,       93     156,       93     156,       93     156,       93     156,       93     156,       94,     156,       94,     156,       95     156,       96     147,       97     156,       98     147,       93     147,       94,     &lt;</td><td>94     151.       94     151.       94     151.       94     151.       94     151.       94     151.       94     151.       93     150.       93     151.       93     151.       93     151.       93     151.       93     151.       93     151.       94     152.       95     151.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.</td><td>94     1514       94     1515       94     1516       94     1516       94     1516       94     1516       93     1506       93     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       99     1517       99     1516       99     1506       91     1506       92     2444       93     1556       94     1556       95     1507       95     1506       96     1507       97     1556       98     1420       93     1506       94     1544       95     1566       96     1567       97     1556       98     1566       98     1566       98     1566       98     1566       98     1566</td><td>94     1514       94     1515       94     1515       94     1515       94     1516       94     1516       93     1506       93     1506       93     1516       93     1516       93     1506       93     1516       98     1517       98     1516       98     1517       98     1516       98     1517       99     1516       99     1516       99     1516       99     1506       91     1506       92     2444       93     1566       94     1547       93     1566       94     1567       95     1566       96     1566       97     1566       98     1566       94     1566       95     1566       96     1566       97     1567       98     1566       98     1566       98     1566       96     1566       96     1567       97     1567       98     1566</td></l<></ul> | <ol> <li>94 151.</li> <li>94 151.</li> <li>94 151.</li> <li>94 151.</li> <li>94 151.</li> <li>94 150.</li> <li>93 151.</li> <li>93 151.</li> <li>83 151.</li> <li>88 151.</li> <li>99 150.</li> <li>90 150.</li> <li>90 150.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 94     1514       94     1515       94     1515       94     1515       94     1516       93     1516       93     1516       93     1516       83     1516       88     1517       88     1517       88     1516       88     1516       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517       88     1517                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 94     151.       94     151.       94     151.       91     151.       94     151.       94     151.       93     150.       93     151.       93     151.       93     151.       83     150.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     151.       88     150.       88     150.       88     150.       88     150.       88     150.       88     150.       88     150.       88     150.                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     150,       93     151,       93     151,       93     151,       93     151,       93     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       89     151,       89     151,       89     151,       89     150,       89     150,       89     150,       89     150,       89     150,       89     150,       89     150,       89     150,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     150,       93     151,       93     151,       83     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       89     151,       89     151,       89     151,       89     151,       89     151,       89     151,       89     151,       91,     150,       82     150,       83     150,       83     150,       83     150,       83     150,       83     150,       83     150,       84     150,       85     150,       86     150,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 94     151.       94     151.       94     151.       94     151.       94     151.       94     151.       93     1516.       93     1516.       93     1516.       93     1516.       93     1516.       93     1516.       98     1514.       88     1514.       88     1514.       88     1514.       88     1517.       88     1517.       88     1517.       88     1517.       89     1517.       89     1517.       93     1516.       93     1517.       93     1516.       93     1517.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.       93     1507.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                              | 94     151.       94     1516       94     1515       94     1516       94     1516       94     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       93     1516       98     1524       88     1524       88     1517       88     1516       88     1517       88     1516       88     1517       88     1516       88     1517       88     1516       88     1517       88     1516       88     1517       88     1517       93     1516       93     1517       93     1507       93     1507       93     1507       93     1507       93     1507       93     1475                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     150,       93     151,       93     151,       93     150,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       89     151,       90     151,       91     150,       92     150,       93     150,       94     150,       95     150,       96     150,       97     155,       93     150,       94     150,       95     150,       93     150,       94     150,       95     150,       93     150,       94     150,       95     150,       96     147,       97     150,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       94     151,       93     1516,       93     1516,       93     1516,       83     1516,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       88     151,       93     151,       93     151,       93     151,       93     151,       93     150,       93     150,       93     150,       93     150,       93     156,       93     156,       93     156,       93     156,       93     156,       94,     156,       94,     156,       95     156,       96     147,       97     156,       98     147,       93     147,       94,     <                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 94     151.       94     151.       94     151.       94     151.       94     151.       94     151.       94     151.       93     150.       93     151.       93     151.       93     151.       93     151.       93     151.       93     151.       94     152.       95     151.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.       95     157.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 94     1514       94     1515       94     1516       94     1516       94     1516       94     1516       93     1506       93     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       88     1516       99     1517       99     1516       99     1506       91     1506       92     2444       93     1556       94     1556       95     1507       95     1506       96     1507       97     1556       98     1420       93     1506       94     1544       95     1566       96     1567       97     1556       98     1566       98     1566       98     1566       98     1566       98     1566                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 94     1514       94     1515       94     1515       94     1515       94     1516       94     1516       93     1506       93     1506       93     1516       93     1516       93     1506       93     1516       98     1517       98     1516       98     1517       98     1516       98     1517       99     1516       99     1516       99     1516       99     1506       91     1506       92     2444       93     1566       94     1547       93     1566       94     1567       95     1566       96     1566       97     1566       98     1566       94     1566       95     1566       96     1566       97     1567       98     1566       98     1566       98     1566       96     1566       96     1567       97     1567       98     1566                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                               
                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | 1.485 0.9   | 6.0 966.0   |            | 0.965 0.9                      | 0.965 0.9<br>0.861 0.9                    | 0.965 0.9<br>0.861 0.9<br>0.862 0.9                  | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9                                                                                              | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9<br>0.880 0.9                                                                                                                           | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9<br>0.880 0.9<br>0.881 0.9                                                                            | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9<br>0.881 0.9<br>0.881 0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9<br>0.880 0.9<br>0.881 0.9<br>0.931 0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9<br>0.880 0.9<br>0.881 0.9<br>0.931 0.8<br>0.933 0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9<br>0.880 0.9<br>0.881 0.9<br>0.931 0.8<br>0.933 0.8<br>0.930 0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.965     0.9       0.861     0.9       0.862     0.9       0.862     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.931     0.8       0.933     0.8       0.936     0.9       0.933     0.8       0.935     0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.965 0.9<br>0.861 0.9<br>0.862 0.9<br>1.076 0.9<br>0.881 0.9<br>0.881 0.9<br>0.931 0.8<br>0.933 0.8<br>0.936 0.8<br>0.935 0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 0.965     0.9       0.861     0.9       0.862     0.9       1.076     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.881     0.9       0.933     0.8       0.933     0.8       0.933     0.8       0.935     0.8       0.935     0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.965     0.9       0.861     0.9       0.862     0.9       0.862     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.933     0.8       0.933     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.941     0.8       0.951     0.8       0.951     0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.965     0.9       0.861     0.9       0.862     0.9       0.862     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.881     0.9       0.933     0.8       0.933     0.8       0.933     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.965     0.9       0.861     0.9       0.862     0.9       0.862     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.883     0.8       0.933     0.8       0.933     0.8       0.933     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.965     0.9       0.861     0.9       0.862     0.9       1.076     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.933     0.8       0.933     0.8       0.935     0.8       0.935     0.8       0.955     0.8       0.951     0.8       0.955     0.8       0.955     0.8       0.951     0.8       0.951     0.8       0.951     0.8       0.951     0.8       0.951     0.8       0.951     0.8       0.951     0.8       0.951     0.8       0.951     0.8       0.953     0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.965     0.9       0.861     0.9       0.862     0.9       0.862     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.881     0.9       0.933     0.8       0.933     0.8       0.935     0.8       0.956     0.8       0.957     0.8       0.957     0.8       0.955     0.8       0.955     0.8       0.955     0.8       0.955     0.8       0.955     0.8       0.955     0.8       0.955     0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.965     0.9       0.861     0.9       0.862     0.9       0.862     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.883     0.8       0.933     0.8       0.933     0.8       0.9346     0.8       0.9355     0.8       0.9356     0.8       0.9357     0.8       0.9356     0.8       0.9356     0.8       0.9556     0.8       0.9555     0.8       0.9556     0.8       0.9557     0.9       0.9556     0.8       0.9556     0.8       0.9556     0.8       0.9556     0.8       0.9557     0.9       0.9556     0.8       0.9556     0.8       0.9556     0.9       2.1400     0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.965     0.9       0.861     0.9       0.862     0.9       1.076     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.881     0.9       0.933     0.8       0.933     0.8       0.935     0.8       0.946     0.8       0.9556     0.8       0.9571     0.8       0.9573     0.8       0.9574     0.8       0.9575     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.8       0.9576     0.9       2.9671     0.9       2.9671     0.9       2.9671     0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.965       0.9         0.861       0.9         0.862       0.9         0.862       0.9         1.076       0.9         1.076       0.9         0.881       0.9         0.8831       0.9         0.8831       0.8         0.933       0.8         0.933       0.8         0.946       0.8         0.956       0.8         0.951       0.8         0.951       0.8         0.955       0.8         0.955       0.8         0.955       0.8         0.955       0.8         0.955       0.8         0.955       0.8         0.955       0.8         0.955       0.8         1.487       0.9                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.965     0.9       0.861     0.9       0.862     0.9       0.862     0.9       1.076     0.9       0.880     0.9       0.881     0.9       0.8831     0.8       0.933     0.8       0.933     0.8       0.933     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.935     0.8       0.946     0.8       0.935     0.8       0.941     0.8       0.955     0.8       0.955     0.8       0.955     0.8       0.955     0.8       2.140     0.9       2.140     0.9       2.140     0.9       2.140     0.9       2.140     0.9       2.140     0.9       2.961     0.9       1.487     0.9       3.052     0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.965         0.9           0.861         0.9           0.862         0.9           0.882         0.9           1.076         0.9           0.880         0.9           0.881         0.9           0.883         0.8           0.881         0.9           0.883         0.8           0.933         0.8           0.933         0.8           0.933         0.8           0.933         0.8           0.933         0.8           0.935         0.8           0.935         0.8           0.935         0.8           0.935         0.8           0.935         0.8           0.955         0.8           0.955         0.8           0.955         0.8           0.955         0.8           2.1440         0.9           2.1487         0.9           3.055         0.9           3.055         0.9           3.055         0.9              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.965         0.9           0.861         0.9           0.862         0.9           0.862         0.9           1.076         0.9           1.076         0.9           0.880         0.9           0.881         0.9           0.881         0.9           0.881         0.9           0.933         0.8           0.933         0.8           0.9346         0.8           0.946         0.8           0.955         0.8           0.9541         0.8           0.9551         0.8           0.9551         0.8           0.9551         0.8           0.9551         0.8           0.9551         0.9           2.140         0.9           2.3057         0.9           3.052         0.9           3.067         0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.965       0.9         0.861       0.9         0.862       0.9         0.862       0.9         1.076       0.9         1.076       0.9         0.881       0.9         0.8831       0.9         0.8831       0.8         0.933       0.8         0.933       0.8         0.9346       0.8         0.9357       0.8         0.946       0.8         0.947       0.8         0.935       0.8         0.941       0.8         0.955       0.8         0.955       0.8         0.955       0.8         0.955       0.8         1.487       0.9         2.140       0.9         2.1487       0.9         3.052       0.9         3.052       0.9         3.052       0.9         3.067       0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| 526 0.270          | 0.17.0      | 0.269       | 0.273      |                                | 959 0.269                                 | 959 0.269<br>949 0.269                               | 59         0.269           349         0.269           142         0.268                                                                      | 959 0.269<br>949 0.269<br>142 0.268<br>947 0.270                                                                                                                                        | 359         0.269           449         0.269           447         0.268           947         0.269           953         0.269                     | 59         0.269           449         0.269           442         0.269           947         0.268           553         0.269           253         0.269                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 949         0.269           949         0.269           947         0.268           953         0.269           953         0.269           953         0.263           958         0.263                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 559     0.269       349     0.269       347     0.268       353     0.269       353     0.263       356     0.266                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 59     0.269       449     0.269       447     0.268       453     0.268       553     0.269       56     0.266       556     0.266       570     0.255                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 559     0.269       349     0.269       347     0.268       353     0.269       353     0.269       358     0.266       356     0.266       370     0.256       360     0.255                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul> <li>949</li> <li>947</li> <li>947</li> <li>9.269</li> <li>947</li> <li>9.268</li> <li>953</li> <li>9.263</li> <li>958</li> <li>9.266</li> <li>956</li> <li>9.266</li> <li>9.265</li> <li>9.266</li> <li>9.265</li> <li>9.266</li> <li>9.265</li> <li>9.265</li> <li>9.266</li> <li>9.266</li> <li>9.265</li> <li>9.266</li> <li>9.265</li> <li>9.266</li> <li>9.266</li> <li>9.266</li> <li>9.265</li> <li>9.266</li> <li>9.266</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 949     0.269       949     0.269       947     0.269       953     0.269       953     0.266       956     0.266       956     0.266       970     0.255       970     0.255       978     0.264       970     0.255       971     0.255       972     0.264                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 949     0.269       949     0.269       947     0.269       953     0.268       953     0.269       953     0.266       956     0.266       956     0.266       970     0.255       978     0.265       976     0.265       960     0.265       976     0.265                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                           | 959     0.269       949     0.269       947     0.268       953     0.268       953     0.263       956     0.266       956     0.265       975     0.264       976     0.264       976     0.264       976     0.264       976     0.264       976     0.264       966     0.264       960     0.264                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 959     0.269       947     0.269       947     0.268       947     0.263       953     0.263       958     0.266       958     0.266       956     0.266       956     0.265       970     0.265       970     0.265       960     0.265       974     0.265       975     0.264       976     0.265       977     0.265       978     0.265                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 949     0.269       949     0.269       947     0.268       953     0.268       953     0.266       958     0.266       958     0.266       958     0.266       959     0.265       960     0.265       978     0.265       960     0.264       974     0.265       975     0.265       960     0.265       978     0.265       978     0.265       978     0.265       979     0.265               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 949     0.269       949     0.269       947     0.268       953     0.268       953     0.263       956     0.266       956     0.266       970     0.265       960     0.264       978     0.265       960     0.264       978     0.265       960     0.264       978     0.265       979     0.265       970     0.265       971     0.265       973     0.265                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 959     0.269       949     0.269       947     0.268       953     0.268       953     0.263       956     0.266       956     0.266       956     0.266       956     0.265       970     0.265       970     0.265       971     0.265       966     0.265       978     0.265       979     0.265       971     0.265       978     0.265       979     0.265       971     0.265       973     0.265       974     0.265       973     0.265       974     0.265       973     0.265                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 45     0.269       44     0.269       47     0.269       47     0.269       55     0.269       55     0.269       56     0.266       56     0.266       56     0.266       56     0.266       56     0.266       56     0.266       56     0.266       56     0.266       56     0.266       57     0.265       56     0.266       57     0.265       56     0.266       57     0.265       57     0.265       56     0.264       57     0.265       57     0.265       57     0.265       57     0.265       57     0.265       57     0.265       57     0.265       57     0.265       57     0.265       57     0.265       57     0.265       57     0.266       57     0.266       57     0.266       57     0.266       58     0.266       59     0.266       50     0.266       50     0.266                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 949     0.269       949     0.269       947     0.269       953     0.268       956     0.266       956     0.266       956     0.266       970     0.265       971     0.264       966     0.265       966     0.264       966     0.264       960     0.264       971     0.265       960     0.264       960     0.264       971     0.265       960     0.264       973     0.264       960     0.264       974     0.265       973     0.264       960     0.264       974     0.265       973     0.264       974     0.265       973     0.264       960     0.264       974     0.265       903     0.214       903     0.214       903     0.229                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 949     0.269       947     0.269       947     0.269       953     0.268       953     0.263       956     0.266       956     0.266       975     0.264       976     0.265       966     0.264       978     0.265       966     0.264       978     0.264       979     0.264       971     0.264       960     0.264       978     0.265       960     0.264       974     0.265       973     0.264       969     0.265       903     0.214       917     0.2265       917     0.2265                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 359     0.269       347     0.269       353     0.269       353     0.263       353     0.263       354     0.263       355     0.266       356     0.265       377     0.265       376     0.265       377     0.265       378     0.265       379     0.265       374     0.265       374     0.265       374     0.265       374     0.266       378     0.265       374     0.266       378     0.265       379     0.265       369     0.2265       369     0.2265                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 949     0.269       949     0.269       947     0.269       953     0.269       953     0.266       956     0.266       956     0.266       970     0.265       971     0.265       960     0.264       971     0.265       960     0.264       960     0.264       960     0.264       960     0.264       960     0.264       960     0.264       974     0.265       973     0.264       960     0.264       974     0.265       973     0.264       960     0.264       974     0.265       973     0.264       974     0.265       973     0.265       974     0.265       973     0.266       974     0.266       973     0.214       973     0.264       973     0.266       973     0.266       974     0.266       973     0.266       974     0.266       975     0.266       974     0.266       974     0.266 <t< td=""><td>949     0.269       949     0.269       947     0.269       953     0.269       953     0.269       956     0.266       956     0.265       975     0.264       976     0.265       960     0.264       971     0.264       966     0.264       966     0.264       960     0.264       971     0.264       969     0.264       960     0.264       973     0.264       960     0.264       974     0.265       973     0.264       960     0.264       974     0.265       973     0.264       903     0.224       903     0.214       903     0.229       917     0.216       917     0.216       917     0.216</td></t<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 949     0.269       949     0.269       947     0.269       953     0.269       953     0.269       956     0.266       956     0.265       975     0.264       976     0.265       960     0.264       971     0.264       966     0.264       966     0.264       960     0.264       971     0.264       969     0.264       960     0.264       973     0.264       960     0.264       974     0.265       973     0.264       960     0.264       974     0.265       973     0.264       903     0.224       903     0.214       903     0.229       917     0.216       917     0.216       917     0.216                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              | | | | | | | | | | | | | | | |
                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| 3 643 1 520        | 200         | 3.496 1.05  | 3.541 1.02 |                                | 3.492 0.959                               | 3.492 0.959<br>3.500 0.949                           | 3.492 0.959<br>3.500 0.949<br>3.471 1.14                                                                                                      | 3.492 0.95(<br>3.500 0.94(<br>3.471 1.14;<br>3.498 0.94                                                                                                                                 | 3.492 0.955<br>3.500 0.944<br>3.471 1.14;<br>3.498 0.94;<br>3.505 0.95;                                                                               | 3.492 0.955<br>3.500 0.944<br>3.471 1.14;<br>3.498 0.94;<br>3.505 0.955<br>3.407 1.121                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3.492 0.95(<br>3.500 0.94(<br>3.471 1.14)<br>3.498 0.94(<br>3.505 0.95(<br>3.407 1.12)<br>3.458 1.05(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.492 0.95(<br>3.500 0.94(<br>3.471 1.14(<br>3.498 0.94(<br>3.505 0.95(<br>3.407 1.12(<br>3.478 1.05(<br>3.479 1.05(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.492 0.955<br>3.500 0.944<br>3.471 1.144<br>3.498 0.947<br>3.505 0.955<br>3.407 1.121<br>3.479 1.055<br>3.479 1.055                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.492 0.95(<br>3.500 0.94(<br>3.471 1.14)<br>3.498 0.94(<br>3.505 0.95(<br>3.407 1.12)<br>3.458 1.05(<br>3.479 1.05(<br>3.428 1.05(<br>3.428 1.05(<br>3.428 1.05(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.492 0.955<br>3.500 0.944<br>3.471 1.14;<br>3.498 0.94;<br>3.505 0.955<br>3.407 1.125<br>3.479 1.055<br>3.479 1.055<br>3.428 1.056<br>3.428 1.066<br>3.436 1.070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 3.492 0.955<br>3.500 0.944<br>3.471 1.14;<br>3.498 0.94;<br>3.505 0.95;<br>3.407 1.12<br>3.479 1.055<br>3.479 1.055<br>3.428 1.065<br>3.436 1.076<br>3.436 1.076                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3.492     0.95       3.500     0.94       3.492     0.94       3.471     1.14       3.498     0.94       3.498     0.95       3.450     0.95       3.451     1.12       3.453     1.05       3.479     1.05       3.479     1.05       3.479     1.05       3.479     1.05       3.428     1.07       3.436     1.07       3.456     1.07       3.456     1.07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.492 0.955<br>3.500 0.944<br>3.471 1.144<br>3.498 0.945<br>3.505 0.955<br>3.479 1.055<br>3.479 1.055<br>3.478 1.055<br>3.478 1.075<br>3.428 1.077<br>3.426 1.077<br>3.450 1.067<br>3.450 1.067<br>3.450 1.067<br>3.467 1.066                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3.492     0.95;       3.500     0.94;       3.471     1.14;       3.498     0.94;       3.498     0.95;       3.505     0.95;       3.407     1.12;       3.458     1.05;       3.479     1.05;       3.479     1.05;       3.479     1.05;       3.479     1.06;       3.476     1.07;       3.450     1.06;       3.450     1.06;       3.450     1.06;       3.450     1.06;       3.455     1.07;       3.455     1.06;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.492     0.95       3.500     0.94       3.492     0.94       3.471     1.14       3.498     0.95       3.498     0.95       3.450     0.95       3.451     1.05       3.453     1.05       3.456     1.05       3.456     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.492     0.95;       3.500     0.94;       3.492     0.94;       3.471     1.14;       3.498     0.95;       3.498     0.95;       3.450     0.95;       3.451     1.05;       3.479     1.05;       3.479     1.05;       3.479     1.05;       3.479     1.05;       3.476     1.07;       3.436     1.07;       3.440     1.07;       3.450     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     2.19;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.492     0.95;       3.500     0.94;       3.471     1.14;       3.498     0.94;       3.498     0.95;       3.505     0.95;       3.407     1.12;       3.458     1.05;       3.479     1.05;       3.479     1.06;       3.450     1.06;       3.450     1.06;       3.450     1.06;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     1.07;       3.455     2.19;       3.455     2.19;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.492     0.95i       3.500     0.94i       3.492     0.94i       3.498     0.94i       3.498     0.95i       3.498     0.95i       3.498     0.95i       3.498     0.95i       3.498     0.95i       3.459     1.05i       3.458     1.05i       3.458     1.05i       3.456     1.07i       3.455     2.19i       3.265     2.19i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3.492 0.95(<br>3.500 0.94(<br>3.471 1.14)<br>3.498 0.94(<br>3.498 0.95)<br>3.407 1.12(<br>3.458 1.05(<br>3.456 1.07(<br>3.456 1.07(<br>3.455 1.07(<br>3.455 1.07(<br>3.455 1.07(<br>3.455 1.07(<br>3.455 2.19)<br>3.265 2.19<br>3.264 1.56(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.492     0.95i       3.500     0.94i       3.471     1.14;       3.498     0.94i       3.498     0.95;       3.498     0.95;       3.450     0.95;       3.451     1.12i       3.452     1.05i       3.453     1.05i       3.456     1.07i       3.455     2.19i       3.455     2.19i       3.455     2.19i       3.455     2.19i       3.455     2.19i       3.455     2.19i       3.913     7.18i       2.143     3.11i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.492     0.95i       3.500     0.94i       3.492     0.94i       3.498     0.94i       3.498     0.95i       3.498     0.95i       3.456     1.05i       3.457     1.05i       3.458     1.05i       3.459     1.05i       3.451     1.05i       3.452     1.05i       3.455     1.07i       3.456     1.07i       3.457     1.07i       3.458     1.07i       3.458     1.07i       3.458     1.07i       3.458     1.07i       3.458     1.07i       3.458     1.17i       3.484     1.43i       3.411'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3.492     0.95       3.500     0.94       3.492     0.94       3.498     0.94       3.498     0.95       3.498     0.95       3.450     1.05       3.451     1.05       3.452     1.05       3.453     1.05       3.456     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.413     1.07       3.484     1.43       3.413     3.41       3.484     1.43       3.41     3.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.492     0.95       3.500     0.94       3.471     1.14       3.498     0.94       3.498     0.95       3.498     0.95       3.450     1.05       3.451     1.12       3.452     1.05       3.453     1.05       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.455     1.07       3.456     1.07       3.456     1.07       3.458     1.07       3.458     1.07       3.458     1.13       3.458     1.143       3.458     1.143 <td< td=""></td<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       | | | | | | | | | | | | | | | | | | | | | | |
                                                                                                                |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                
                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| 7                  | 0.350 3     | 0.350 3     | 0.350 3    |                                | 0.422 3                                   | 0.422 3<br>0.397 3                                   | 0.422 3<br>0.397 3<br>0.381 3                                                                                                                 | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3                                                                                                                                                | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.362 3                                                                                                   | 0.422 3<br>0.397 3<br>0.381 3<br>0.362 3<br>0.362 3<br>0.362 3<br>0.636 <sup>5</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.352 3<br>0.362 3<br>0.502 3<br>0.500 5<br>0.500 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.350 3<br>0.352 3<br>0.352 3<br>0.352 3<br>0.352 3<br>0.500 3<br>0.500 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.422 3<br>0.397 3<br>0.381 3<br>0.362 3<br>0.362 3<br>0.362 3<br>0.500 3<br>0.500 3<br>0.500 3<br>0.500 3<br>0.500 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.352 3<br>0.352 3<br>0.352 3<br>0.352 3<br>0.500 3<br>0.500 3<br>0.500 3<br>0.500 3<br>0.500 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.350 3<br>0.362 3<br>0.500 3<br>0.5000 3<br>0.50000 3<br>0.50000 3<br>0.50000 3<br>0.500000000000000000000000000000000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.362 3<br>0.560 3<br>0.500 3<br>0.5000 3<br>0000 3<br>0000 3<br>0000 3<br>000000000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.350 3<br>0.500 3<br>0.5000 3<br>0.50000 3<br>0.5000 3<br>0.5000 3<br>0.5000 3<br>0.5000 3<br>0.50000 3<br>0.50000 3<br>0.50000 3<br>0.500000000000000000000000000000000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.362 3<br>0.500 3<br>000 3<br>0.500 3<br>0000 3<br>0000 3<br>0000 3<br>0000000000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.422 3<br>0.397 3<br>0.381 3<br>0.350 3<br>0.362 3<br>0.500 3<br>000 3<br>0.500 3<br>0000 3<br>0000 3<br>0000 3<br>0000 3<br>00000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                      | 0.422       3         0.397       3         0.391       3         0.381       3         0.350       3         0.550       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.422       3         0.397       3         0.397       3         0.381       3         0.350       3         0.352       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.422       3         0.397       3         0.381       3         0.350       3         0.352       3         0.362       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.422       3         0.397       3         0.381       3         0.350       3         0.362       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3         0.500       3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            | | | | | | | | | | | | | | | | | | | | | | | | |
                                                                                          |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   
                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| 206Pb              | 0.0946      | 0.0943      |            | 0.0942                         | 0.0942<br>0.0940                          | 0.0942<br>0.0940<br>0.0944                           | 0.0942<br>0.0940<br>0.0944<br>0.0940                                                                                                          | 0.0942<br>0.0940<br>0.0944<br>0.0940<br>0.0939                                                                                                                                          | 0.0942<br>0.0940<br>0.0944<br>0.0940<br>0.0939<br>0.0945                                                                                              | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0939<br>0.0938                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0939<br>0.0938<br>0.0945<br>0.0933                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0938<br>0.0938<br>0.0938<br>0.0938                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0942<br>0.0940<br>0.0944<br>0.0939<br>0.0939<br>0.0938<br>0.0938<br>0.0943<br>0.0933                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0945<br>0.0945<br>0.0948<br>0.0948<br>0.0939<br>0.0939                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0935<br>0.0938<br>0.0938<br>0.0938<br>0.0939<br>0.0939<br>0.0931                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0938<br>0.0938<br>0.0943<br>0.0943<br>0.0933<br>0.0942<br>0.0933                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0945<br>0.0948<br>0.0948<br>0.0948<br>0.0939<br>0.0938<br>0.0938<br>0.0938                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0938<br>0.0938<br>0.0938<br>0.0939<br>0.0939<br>0.0938<br>0.0938<br>0.0938                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0938<br>0.0938<br>0.0943<br>0.0938<br>0.0938<br>0.0938<br>0.0936<br>0.0936                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0938<br>0.0945<br>0.0948<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0936<br>0.0937                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0945<br>0.0948<br>0.0948<br>0.0948<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0937<br>0.0937<br>0.0937                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0936<br>0.0937<br>0.0928                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0945<br>0.0943<br>0.0948<br>0.0948<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0936<br>0.0936<br>0.0936<br>0.0936<br>0.0926                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0942<br>0.0940<br>0.0940<br>0.0946<br>0.0945<br>0.0948<br>0.0948<br>0.0948<br>0.0948<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0937<br>0.0937<br>0.0937<br>0.0937<br>0.0937                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.0942<br>0.0940<br>0.0940<br>0.0940<br>0.0945<br>0.0948<br>0.0948<br>0.0948<br>0.0948<br>0.0938<br>0.0938<br>0.0938<br>0.0936<br>0.0936<br>0.0937<br>0.0936<br>0.0937<br>0.0939<br>0.0939                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.0942<br>0.0940<br>0.0940<br>0.0939<br>0.0938<br>0.0943<br>0.0943<br>0.0943<br>0.0938<br>0.0938<br>0.0938<br>0.0936<br>0.0936<br>0.0936<br>0.0936<br>0.0936<br>0.0936<br>0.0936<br>0.0936<br>0.0936<br>0.0936                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0942<br>0.0940<br>0.0940<br>0.0940<br>0.0939<br>0.0948<br>0.0948<br>0.0948<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0939<br>0.0937<br>0.0938<br>0.0937<br>0.0958<br>0.0939<br>0.0958<br>0.0958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.0942<br>0.0940<br>0.0940<br>0.0940<br>0.0945<br>0.0948<br>0.0948<br>0.0948<br>0.0938<br>0.0938<br>0.0938<br>0.0938<br>0.0937<br>0.0938<br>0.0937<br>0.0938<br>0.0958<br>0.0958<br>0.0958<br>0.0958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| mqq r              | 485         | 393         |            | 436                            | 436<br>257                                | 436<br>257<br>269                                    | 436<br>257<br>269<br>288                                                                                                                      | 436<br>257<br>269<br>288<br>352                                                                                                                                                         | 436<br>257<br>269<br>288<br>352<br>283                                                                                                                | 436<br>257<br>269<br>352<br>352<br>283<br>177                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 436<br>257<br>269<br>269<br>352<br>283<br>283<br>283<br>233                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 436<br>257<br>269<br>288<br>352<br>288<br>288<br>283<br>283<br>233<br>233<br>622                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 436<br>257<br>269<br>288<br>352<br>283<br>283<br>283<br>283<br>283<br>283<br>595                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 436<br>257<br>269<br>288<br>352<br>288<br>352<br>283<br>233<br>233<br>595<br>373                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 436       257       269       283       352       283       353       622       633       635       373       688       373                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 436<br>257<br>269<br>283<br>352<br>283<br>283<br>283<br>622<br>595<br>888<br>286                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 436       257       257       258       352       283       352       283       373       595       373       588       373       588       373       588       595       588       588       588       588       588       588       588       588       588       588       588                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 436       257       257       257       269       352       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       233       234       235       235       236       237       238       233       234       235       235       236       236       237       238       238       258       258       258       258       266       27       28       28       28       28       28       28       28       28       28       28       28       28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 436       257       257       258       283       352       283       373       595       373       566       688       373       566       881       851                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 436       257       257       258       352       283       353       595       373       688       373       688       373       566       851       851                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 436       257       257       258       352       283       352       283       352       283       352       283       353       283       283       283       355       566       588       588       588       588       588       588       588       588       588       588       557                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 436       257       257       258       288       352       288       373       595       373       5557       688       851       557       6530       6530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 436       436       257       257       258       352       283       352       283       352       283       353       595       373       688       373       688       373       688       373       5557       1751       1751       175308                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 436         257         257         258         352         283         352         283         352         283         352         283         352         283         352         283         353         595         595         595         595         555         6638         851         1751         6530         11447                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 436         257         257         257         258         2595         373         595         373         688         373         688         373         881         595         373         881         881         851         5557         1751         1751         11447         15015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 436         257         257         257         257         258         352         283         352         283         352         283         352         283         352         283         352         283         373         595         373         5557         413         851         5557         1751         1751         1751         1751         1751         1751         1751         15015         2570                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 436         257         257         257         257         258         352         288         352         288         352         288         352         283         352         283         353         595         595         595         595         595         595         557         1751         15015         2570         12933                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 436         257         257         257         257         258         352         283         352         283         352         283         352         283         352         283         355         595         595         595         595         595         595         556         557         11447         11447         15015         25700         12933         12933         12933                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| mqq /              | 127         | 5 102       | 111        |                                | 5 67                                      | 5 67<br>4 69                                         | 5 67<br>14 69<br>15 74                                                                                                                        | 55 67<br>14 69<br>15 74<br>16 92                                                                                                                                                        | 55 67<br>55 67<br>55 74<br>55 74<br>6 92<br>55 74                                                                                                     | 85 57<br>55 67<br>55 74<br>55 74<br>74<br>74<br>74<br>74<br>74<br>74                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 55 67<br>55 67<br>55 74<br>66 92<br>55 74<br>88 42<br>8 57<br>57<br>57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 55         67           55         67           55         74           56         74           55         74           56         74           57         74           56         74           56         74           56         74           57         74           56         74           57         74           56         74           57         74           56         57           56         57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 55         67           55         67           55         74           55         74           55         74           55         74           55         74           55         74           55         74           55         74           56         74           57         74           58         74           59         74           50         14           50         14           51         138           53         138                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 55     67       55     67       55     67       55     74       69     92       74     92       74     149       91     138       91     138                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 55     67       55     67       55     67       55     74       56     92       57     74       58     42       59     149       50     138       53     138       53     138       53     138       53     138       53     138                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 67     67       67     67       67     69       68     74       69     92       74     69       61     149       9     91       93     138       93     93       70     165                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>55     57       55     57       55     57       55     74       56     74       57     149       91     138       91     138       55     57       56     57       57     165       50     91       91     137       50     98       50     98       50     98       50     93       50     93</td><td>55     57       55     57       55     57       56     74       56     74       56     57       57     149       58     57       59     91       53     138       50     91       56     138       56     137       56     137       56     137       56     137</td><td>1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1<td>4     6     7     4     6     7       5     5     5     7     4     6     7       6     7     1     1     1     1     1       6     7     7     1     6     1     1       7     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       8     1     1     1     1     1     1       8     1     1     1     1     1     1       8<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>5     5     5     5       5     5     5     5     5       5     5     5     7     4       6     6     6     1     5       5     5     7     1     5       6     1     1     3     3       6     1     1     3     1       7     1     165     9     9       9     9     9     1     3       9     9     9     9     1       9     9     13     3     3       9     137     3     3     3       13     3     3     3     3       13     13     13     1       13     13     1     1       13     1     1     1       13     3     3     3       13     3     3     3       13     3     3     3       13     1     1     1       13     1     1     1       13     1     1     1       13     1     1     1</td><td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>8     44     69       67     67     67       67     74     69       68     74     69       69     91     149       69     91     138       60     138     136       61     138     137       62     133     138       63     133     393       64     670     98       67     737     137       73     138     88       67     137     137       73     137     138       88     670     98       825     137     127</td><td>5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       6     13     3     3     3       6     13     13     3     3       7     165     20     38     13       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       70     137     3     33     33       70     137     3     38     33       8     8     5     203     38       8     8     5     203     38       70     8     8     8     8       8     8     8     8     8       8     8     8     8     8       70     8     8     8     8       8     8     8     8     8       8     8     8     8       9     8     8</td></td></td></td></td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>55     57       55     57       55     57       55     74       56     74       57     149       91     138       91     138       55     57       56     57       57     165       50     91       91     137       50     98       50     98       50     98       50     93       50     93</td> <td>55     57       55     57       55     57       56     74       56     74       56     57       57     149       58     57       59     91       53     138       50     91       56     138       56     137       56     137       56     137       56     137</td> <td>1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1<td>4     6     7     4     6     7       5     5     5     7     4     6     7       6     7     1     1     1     1     1       6     7     7     1     6     1     1       7     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       8     1     1     1     1     1     1       8     1     1     1     1     1     1       8<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>5     5     5     5       5     5     5     5     5       5     5     5     7     4       6     6     6     1     5       5     5     7     1     5       6     1     1     3     3       6     1     1     3     1       7     1     165     9     9       9     9     9     1     3       9     9     9     9     1       9     9     13     3     3       9     137     3     3     3       13     3     3     3     3       13     13     13     1       13     13     1     1       13     1     1     1       13     3     3     3       13     3     3     3       13     3     3     3       13     1     1     1       13     1     1     1       13     1     1     1       13     1     1     1</td><td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>8     44     69       67     67     67       67     74     69       68     74     69       69     91     149       69     91     138       60     138     136       61     138     137       62     133     138       63     133     393       64     670     98       67     737     137       73     138     88       67     137     137       73     137     138       88     670     98       825     137     127</td><td>5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       6     13     3     3     3       6     13     13     3     3       7     165     20     38     13       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       70     137     3     33     33       70     137     3     38     33       8     8     5     203     38       8     8     5     203     38       70     8     8     8     8       8     8     8     8     8       8     8     8     8     8       70     8     8     8     8       8     8     8     8     8       8     8     8     8       9     8     8</td></td></td></td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 55     57       55     57       55     57       55     74       56     74       57     149       91     138       91     138       55     57       56     57       57     165       50     91       91     137       50     98       50     98       50     98       50     93       50     93                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 55     57       55     57       55     57       56     74       56     74       56     57       57     149       58     57       59     91       53     138       50     91       56     138       56     137       56     137       56     137       56     137                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1 <td>4     6     7     4     6     7       5     5     5     7     4     6     7       6     7     1     1     1     1     1       6     7     7     1     6     1     1       7     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       8     1     1     1     1     1     1       8     1     1     1     1     1     1       8<td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>5     5     5     5       5     5     5     5     5       5     5     5     7     4       6     6     6     1     5       5     5     7     1     5       6     1     1     3     3       6     1     1     3     1       7     1     165     9     9       9     9     9     1     3       9     9     9     9     1       9     9     13     3     3       9     137     3     3     3       13     3     3     3     3       13     13     13     1       13     13     1     1       13     1     1     1       13     3     3     3       13     3     3     3       13     3     3     3       13     1     1     1       13     1     1     1       13     1     1     1       13     1     1     1</td><td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>8     44     69       67     67     67       67     74     69       68     74     69       69     91     149       69     91     138       60     138     136       61     138     137       62     133     138       63     133     393       64     670     98       67     737     137       73     138     88       67     137     137       73     137     138       88     670     98       825     137     127</td><td>5     5     5     5       5     5     5     5     5       5    
5     5     5     5       5     5     5     5     5       5     5     5     5     5       6     13     3     3     3       6     13     13     3     3       7     165     20     38     13       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       70     137     3     33     33       70     137     3     38     33       8     8     5     203     38       8     8     5     203     38       70     8     8     8     8       8     8     8     8     8       8     8     8     8     8       70     8     8     8     8       8     8     8     8     8       8     8     8     8       9     8     8</td></td></td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4     6     7     4     6     7       5     5     5     7     4     6     7       6     7     1     1     1     1     1       6     7     7     1     6     1     1       7     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       6     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       7     1     1     1     1     1     1       8     1     1     1     1     1     1       8     1     1     1     1     1     1       8 <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>5     5     5     5       5     5     5     5     5       5     5     5     7     4       6     6     6     1     5       5     5     7     1     5       6     1     1     3     3       6     1     1     3     1       7     1     165     9     9       9     9     9     1     3       9     9     9     9     1       9     9     13     3     3       9     137     3     3     3       13     3     3     3     3       13     13     13     1       13     13     1     1       13     1     1     1       13     3     3     3       13     3     3     3       13     3     3     3       13     1     1     1       13     1     1     1       13     1     1     1       13     1     1     1</td><td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>8     44     69       67     67     67       67     74     69       68     74     69       69     91     149       69     91     138       60     138     136       61     138     137       62     133     138       63     133     393       64     670     98       67     737     137       73     138     88       67     137     137       73     137     138       88     670     98       825     137     127</td><td>5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       6     13     3     3     3       6     13     13     3     3       7     165     20     38     13       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       70     137     3     33     33       70     137     3     38     33       8     8     5     203     38       8     8     5     203     38       70     8     8     8     8       8     8     8     8     8       8     8     8     8     8       70     8     8     8     8       8     8     8     8     8       8     8     8     8       9     8     8</td></td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>5     5     5     5       5     5     5     5     5       5     5     5     7     4       6     6     6     1     5       5     5     7     1     5       6     1 
   1     3     3       6     1     1     3     1       7     1     165     9     9       9     9     9     1     3       9     9     9     9     1       9     9     13     3     3       9     137     3     3     3       13     3     3     3     3       13     13     13     1       13     13     1     1       13     1     1     1       13     3     3     3       13     3     3     3       13     3     3     3       13     1     1     1       13     1     1     1       13     1     1     1       13     1     1     1</td> <td>1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1<td>8     44     69       67     67     67       67     74     69       68     74     69       69     91     149       69     91     138       60     138     136       61     138     137       62     133     138       63     133     393       64     670     98       67     737     137       73     138     88       67     137     137       73     137     138       88     670     98       825     137     127</td><td>5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       6     13     3     3     3       6     13     13     3     3       7     165     20     38     13       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       70     137     3     33     33       70     137     3     38     33       8     8     5     203     38       8     8     5     203     38       70     8     8     8     8       8     8     8     8     8       8     8     8     8     8       70     8     8     8     8       8     8     8     8     8       8     8     8     8       9     8     8</td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5     5     5     5       5     5     5     5     5       5     5     5     7     4       6     6     6     1     5       5     5     7     1     5       6     1     1     3     3       6     1     1     3     1       7     1     165     9     9       9     9     9     1     3       9     9     9     9     1       9     9     13     3     3       9     137     3     3     3       13     3     3     3     3       13     13     13     1       13     13     1     1       13     1     1     1       13     3     3     3       13     3     3     3       13     3     3     3       13     1     1     1       13     1     1     1       13     1     1     1       13     1     1     1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1
<td>8     44     69       67     67     67       67     74     69       68     74     69       69     91     149       69     91     138       60     138     136       61     138     137       62     133     138       63     133     393       64     670     98       67     737     137       73     138     88       67     137     137       73     137     138       88     670     98       825     137     127</td> <td>5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       6     13     3     3     3       6     13     13     3     3       7     165     20     38     13       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       70     137     3     33     33       70     137     3     38     33       8     8     5     203     38       8     8     5     203     38       70     8     8     8     8       8     8     8     8     8       8     8     8     8     8       70     8     8     8     8       8     8     8     8     8       8     8     8     8       9     8     8</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8     44     69       67     67     67       67     74     69       68     74     69       69     91     149       69     91     138       60     138     136       61     138     137       62     133     138       63     133     393       64     670     98       67     737     137       73     138     88       67     137     137       73     137     138       88     670     98       825     137     127                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       5     5     5     5     5       6     13     3     3     3       6     13     13     3     3       7     165     20     38     13       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       8     5     20     38     33       70     137     3     33     33       70     137     3     38     33       8     8     5     203     38       8     8     5     203     38       70     8     8     8     8       8     8     8     8     8       8     8     8     8     8       70     8     8     8     8       8     8     8     8     8       8     8     8     8       9     8     8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                           |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | 1 19.92     | 1 16.15     | 4 17.92    |                                | 7 10.55                                   | 7 10.55<br>8 11.02                                   | 7 10.55<br>8 11.02<br>0 11.85                                                                                                                 | 7 10.55<br>8 11.04<br>0 11.85<br>7 14.46                                                                                                                                                | 7 10.55<br>8 11.04<br>0 11.85<br>7 14.46<br>0 11.65                                                                                                   | 7 10.55<br>8 11.04<br>0 11.86<br>7 14.46<br>0 11.66<br>6 7.48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 10.55<br>8 11.04<br>7 14.46<br>6 7.48<br>1.66<br>7 .48<br>8 9.86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 7 10.55<br>8 11.04<br>0 11.85<br>7 14.46<br>6 7.48<br>6 7.48<br>6 26.34                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 7 10.55<br>8 11.04<br>7 14.46<br>6 7.48<br>6 7.48<br>6 7.48<br>6 26.36<br>7 25.22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7 10.55<br>8 11.04<br>7 14.46<br>6 7.48<br>6 7.48<br>6 7.48<br>6 26.36<br>6 25.25<br>11 25.25<br>15.75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 7 10.55<br>8 11.04<br>0 11.85<br>14.46<br>6 7.48<br>6 7.48<br>6 26.36<br>2 25.25<br>2 29.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 7 10.55<br>8 11.04<br>0 11.85<br>14.46<br>6 7.48<br>6 7.48<br>8 26.36<br>2 25.25<br>1 25.25<br>2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 7     10.55       8     11.04       0     11.85       1     14.46       6     7.48       6     7.48       6     7.48       6     7.48       7     15.75       6     12.15       7     23.93                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 7         10.55           8         11.04           0         11.85           1         14.46           6         7.48           6         7.48           6         7.48           1         9.86           1         9.86           1         25.23           1         25.23           1         25.23           1         25.33           1         23.94           1         1.57                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                 | 7         7         10.55           8         11.04         6         11.85           10         14.46         6         7.48           11         10         9.86         6         7.48           11         10         9.86         8         1.1.65           11         10         9.86         8         1.1.65           11         10         9.86         8         2.5.32           11         15         15         2.5.22         1.1.55           12         15         15         1.5         1.5           12         12         12         1.5         1.5         1.5           12         13         15         1.1         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7     10.55       8     11.04       6     11.85       6     14.46       6     7.48       6     7.48       6     7.48       6     7.48       7     10.55       6     7.48       7     25.22       6     12.15       7     23.96       6     12.15       7     23.39       6     36.07       7     23.55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 7     10.55       8     11.04       0     11.85       1     14.46       6     7.48       6     7.48       6     7.48       6     7.48       1     9.86       6     7.48       1     9.86       6     7.48       1     25.23       1     25.23       6     12.57       6     12.15       7     23.39       6     36.00       7     12.35       7     14.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 7     7     10.55       8     11.04     6     11.85       10     14.46     6     7.48       11     10     10.55     6       11     10     10.65     6       11     10     10.65     11.85       11     10     10.65     11.65       11     10     10.65     11.65       11     10     10.65     11.65       11     10     10.65     11.65       11     10     10.65     11.65       11     10     10.65     11.65       11     10     10.65     11.65       11     10     10.65     11.65       11     10     10.65     10.165       11     10     10.165     10.165       11     10     10.165     10.165       11     10     10.165     10.165       11     10     10.165     10.165       11     10     10.165     10.165       12     10     10.165     10.165       13     10     10.165     10.165       14     10     10.165     10.165       15     10     10.165     10.165       15<                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 7     7       8     8       10.55       9       11.64       11.65       11.65       11.65       11.65       11.65       11.65       11.65       11.65       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15       12.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7     10.55       8     11.04       0     11.85       10.155     14.46       11.05     14.46       11.05     14.46       11.05     14.46       11.05     14.46       11.05     12.52       11.05     12.52       12.15     12.52       12.15     29.17       12.15     23.35       12.15     23.55       12.15     23.55       12.15     23.55       12.15     23.55       12.15     23.55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7     10.55       8     11.04       6     14.46       6     14.46       6     14.46       6     14.46       6     2.43       6     2.43       7     10.55       6     2.43       7     10.55       6     2.63%       6     12.57       7     25.23       6     12.15       7     23.55       6     36.06       7     23.55       6     98.8       6     98.8       6     98.8       7     23.55       6     98.8       7     23.55       8     52.4       9     98.8       6     91.9       9     98.8       6     91.9       7     10.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7     7     10.55       8     11.04     6     11.85       10     11.65     6     11.85       11     11.65     6     11.65       11     11.65     11.65     11.65       11     11.65     11.65     11.65       11     12.15     12.15     12.15       11     12.15     12.15     12.15       12     12.15     12.15     12.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 7     7     7       8     11.05       8     11.05       9     14.46       6     7.48       6     7.48       6     7.48       6     7.48       6     7.48       6     7.57       6     12.15       6     36.05       6     36.05       6     36.05       6     36.05       7     23.55       7     23.55       8     52.45       6     93.60       7     23.55       7     23.55       8     52.45       6     93.60       7     23.55       8     52.45       8     52.45       8     52.45       8     10.33.55       8     10.33.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 7     10.55       8     11.04       0     11.85       10     14.46       11     14.46       11     14.46       11     14.46       11     15.72       11     15.72       11     15.72       11     15.72       11     15.75       12     12.35       13     12.52       14     12.52       12     12.52       13     12.52       14     12.55       14     12.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                      
 |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | 34 0.51     | 79 0.41     | 18 0.44    |                                | 1 0.27                                    | 11 0.27<br>23 0.28                                   | 1 0.27<br>23 0.28<br>46 0.30                                                                                                                  | <ol> <li>1 0.27</li> <li>23 0.28</li> <li>46 0.30</li> <li>46 0.37</li> <li>29 0.37</li> </ol>                                                                                          | 1 0.27<br>23 0.28<br>46 0.30<br>29 0.37<br>46 0.30                                                                                                    | 1 0.27<br>23 0.28<br>16 0.30<br>29 0.37<br>46 0.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1 0.27<br>23 0.28<br>16 0.30<br>29 0.37<br>16 0.30<br>16 0.30<br>37 0.16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1 0.27<br>23 0.28<br>16 0.30<br>29 0.37<br>16 0.30<br>16 0.30<br>73 0.56                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1         0.27           13         0.28           16         0.30           16         0.37           90         0.16           37         0.26           37         0.27           37         0.56           27         0.57           27         0.57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1         0.27           13         0.28           16         0.30           16         0.37           16         0.37           16         0.37           16         0.37           17         0.16           10         0.16           10         0.16           11         0.56           12         0.51           13         0.56           14         0.51           15         0.51           16         0.51                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1         0.27           13         0.28           16         0.30           16         0.37           16         0.37           16         0.37           16         0.37           17         0.16           17         0.216           18         0.37           19         0.16           27         0.21           29         0.36           27         0.36           29         0.36           27         0.37           28         0.36           27         0.37           27         0.37           28         0.36           29         0.36           27         0.37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 1         0.27           13         0.28           16         0.30           16         0.37           16         0.30           16         0.30           17         0.16           18         0.56           19         0.51           10         0.16           11         0.56           12         0.51           13         0.56           14         0.51           15         0.51           16         0.34           17         0.51           18         0.26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1         0.27           13         0.28           16         0.30           16         0.37           16         0.30           16         0.30           16         0.30           17         0.21           18         0.30           19         0.16           10         0.16           11         0.56           12         0.51           13         0.56           14         0.51           17         0.51           18         0.26           18         0.26           18         0.26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1         0.27           13         0.28           16         0.30           16         0.37           16         0.37           16         0.37           17         0.16           18         0.51           19         0.34           11         0.37           12         0.37           13         0.56           14         0.36           18         0.36           18         0.36           18         0.36           18         0.36           19         0.36           18         0.36           19         0.36           10         0.34                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1         0.27           13         0.28           16         0.30           16         0.37           16         0.30           16         0.30           17         0.51           18         0.56           19         0.51           10         0.16           11         0.32           12         0.51           13         0.56           14         0.51           17         0.51           17         0.36           17         0.36                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1     0.27       1     0.28       16     0.30       16     0.37       16     0.37       17     0.51       18     0.56       17     0.51       18     0.26       19     0.34       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       10     0.56                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1         0.27           1         0.28           16         0.30           16         0.37           16         0.37           17         0.16           17         0.21           18         0.34           17         0.34           18         0.34           18         0.34           18         0.36           19         0.34           11         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           0.35         0.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1         0.27           1         0.28           16         0.30           16         0.30           16         0.30           17         0.16           18         0.51           19         0.34           10         0.16           11         0.51           12         0.51           13         0.56           14         0.34           17         0.51           17         0.56           17         0.56           17         0.57           17         0.35           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.37           10         0.36           0         0.37           0         1.08           0         1.08           0         1.08           0         1.08           0         1.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1         0.27           1         0.28           16         0.30           16         0.37           17         0.16           18         0.51           17         0.51           18         0.56           19         0.34           17         0.51           18         0.56           19         0.36           10         0.51           11         0.56           12         0.56           13         0.56           14         0.56           17         0.56           17         0.57           17         0.56           17         0.56           17         0.56           17         0.56           17         0.56           10         0.56      10         0.56           10         0.56           10         0.56           10         0.56           10         0.56           10         0.56           10         0.56           10         0.56      10         0.56 <td>1         0.27           1         0.28           16         0.30           16         0.37           16         0.37           17         0.16           17         0.21           17         0.21           17         0.21           17         0.21           18         0.26           18         0.26           18         0.26           19         0.34           17         0.26           18         0.26           17         0.26           17         0.26           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           33         2.06           33         2.06</td> <td>1         0.27           1         0.28           16         0.30           19         0.37           10         0.16           11         0.28           12         0.37           13         0.28           14         0.37           15         0.21           17         0.51           18         0.36           17         0.51           17         0.52           17         0.51           17         0.51           17         0.35           17         0.35           17         0.35           17         0.35           17         0.35           17         0.35           17         0.35           39         2.36           39         2.06           07         1.96           190         1.106</td> <td>1     0.27       1     0.23       16     0.30       16     0.37       16     0.37       17     0.51       18     0.52       19     0.34       10     0.46       11     0.51       12     0.51       13     0.55       14     0.55       15     0.51       16     0.34       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.57       100     1.08       23     2.06       00     1.96       07     1.96       13     0.55</td> <td>1     0.27       1     0.23       16     0.30       16     0.37       16     0.37       17     0.26       17     0.51       18     0.26       19     0.34       10     0.51       11     0.56       12     0.51       13     0.56       14     0.36       15     0.51       16     0.34       17     0.56       18     0.26       19     0.36       11     0.36       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.75       12     0.51       13     2.26       13     0.55       13     0.55</td> <td>1     0.27       1     0.2       19     0.37       19     0.37       10     0.16       11     0.26       12     0.21       13     0.26       14     0.37       15     0.21       16     0.37       17     0.51       18     0.26       17     0.62       18     0.26       17     0.37       17     0.51       17     0.36       17     0.36       17     0.36       17     0.37       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.37       170     0.36       23     2.36       23     2.36       23     2.38       23     2.38       23     2.38       23     2.38       24     2.38</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1         0.27           1         0.28           16         0.30           16         0.37           16         0.37           17         0.16           17         0.21           17         0.21           17         0.21           17         0.21           18         0.26           18         0.26           18         0.26           19         0.34           17         0.26           18         0.26           17         0.26           17         0.26           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           17         0.36           33         2.06           33         2.06                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1         0.27           1         0.28           16         0.30           19         0.37           10         0.16           11         0.28           12         0.37           13         0.28           14         0.37           15         0.21           17         0.51           18         0.36           17         0.51           17         0.52           17         0.51           17         0.51           17         0.35           17         0.35           17         0.35           17         0.35           17         0.35           17         0.35           17         0.35           39         2.36           39         2.06           07         1.96           190         1.106                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1     0.27       1     0.23       16     0.30       16     0.37       16     0.37       17     0.51       18     0.52       19     0.34       10     0.46       11     0.51       12     0.51       13     0.55       14     0.55       15     0.51       16     0.34       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.56       17     0.57       100     1.08       23     2.06       00     1.96       07     1.96       13     0.55                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1     0.27       1     0.23       16     0.30       16     0.37       16     0.37       17     0.26       17     0.51       18     0.26       19     0.34       10     0.51       11     0.56       12     0.51       13     0.56       14     0.36       15     0.51       16     0.34       17     0.56       18     0.26       19     0.36       11     0.36       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.76       11     0.75       12     0.51       13     2.26       13     0.55       13     0.55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1     0.27       1     0.2       19     0.37       19     0.37       10     0.16       11     0.26       12     0.21       13     0.26       14     0.37       15     0.21       16     0.37       17     0.51       18     0.26       17     0.62       18     0.26       17     0.37       17     0.51       17     0.36       17     0.36       17     0.36       17     0.37       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.36       17     0.37       170     0.36       23     2.36       23     2.36       23     2.38       23     2.38       23     2.38       23     2.38       24     2.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | 92 5.94     | 19 4.75     | 76 5.16    |                                | 59 3.11                                   | 59 3.11<br>36 3.23                                   | 59 3.11<br>36 3.23<br>76 3.46                                                                                                                 | <ul> <li>59 3.11</li> <li>36 3.23</li> <li>76 3.46</li> <li>00 4.25</li> </ul>                                                                                                          | <ul> <li>59 3.11</li> <li>36 3.23</li> <li>76 3.46</li> <li>00 4.26</li> <li>49 3.46</li> </ul>                                                       | 59         3.11           36         3.23           36         3.23           76         3.46           00         4.25           49         3.46           49         3.46           33         1.90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <ol> <li>359 3.11</li> <li>36 3.23</li> <li>36 3.23</li> <li>36 3.24</li> <li>3.46</li> <li>3.46</li> <li>49 3.46</li> <li>49 3.46</li> <li>49 3.46</li> <li>49 3.46</li> <li>49 3.45</li> <li>49 3.45</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 59         3.11           36         3.23           76         3.46           00         4.29           49         3.46           93         1.90           83         1.90           83         2.57           08         6.7%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 59         3.11           36         3.23           36         3.23           76         3.46           90         4.29           91         3.46           93         3.46           93         3.46           93         1.90           93         1.90           93         1.90           93         1.90           93         2.57           98         2.57           98         6.75           20         6.27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ol> <li>59 3.11</li> <li>36 3.23</li> <li>36 3.46</li> <li>3.46</li> <li>3.46</li> <li>3.46</li> <li>4.29</li> <li>3.46</li> <li>49 3.46</li> <li>49 3.46</li> <li>53 4.06</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 59     3.11       36     3.23       36     3.46       39     4.26       39     1.90       39     1.90       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       34     2.57       35     4.05       70     7.47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 59     3.11       36     3.23       36     3.46       49     3.46       39     1.90       39     1.90       30     1.95       33     2.57       53     4.05       53     4.05       70     7.47       70     7.47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ol> <li>59 3.11</li> <li>36 3.23</li> <li>36 3.46</li> <li>3.46</li> <li>3.46</li> <li>4.29</li> <li>3.46</li> <li>4.9</li> <li>4.05</li> <li>53 4.05</li> <li>54 4.05</li> <li>55 4.05</li> <li>56 6.25</li> <li>57 5.14</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 59     3.11       36     3.23       36     3.46       30     4.29       31     3.46       39     1.90       31     2.57       33     2.57       33     2.57       33     2.57       33     2.57       53     4.05       53     4.05       70     3.16       88     6.27       88     6.24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 59     3.11       36     3.23       36     3.46       39     4.29       39     3.46       39     1.90       33     2.57       33     2.57       33     2.57       53     4.05       53     4.05       53     4.05       53     4.05       53     4.05       58     6.27       58     6.27       58     6.27       58     6.27       58     6.27       58     6.27       58     6.27       58     9.17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 59     3.11       36     3.23       36     3.46       37     3.46       39     3.46       30     3.46       31     5.3       32     3.257       33     2.57       33     2.57       33     2.57       20     6.73       21     6.73       22     4.06       53     4.05       53     4.05       53     4.05       54     6.25       58     6.25       94     6.26       94     6.26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 59     3.11       36     3.23       36     3.46       37     3.46       38     3.46       39     1.90       39     1.90       31     1.90       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       34     6.27       35     6.27       36     6.27       37.16     7.47       53     4.06       54     9.17       95     9.17       95     9.17       96     6.21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 59     3.11       36     3.23       36     3.46       39     4.29       39     3.46       39     1.90       30     1.95       33     2.57       33     2.57       33     2.57       33     2.57       53     4.05       53     4.05       53     4.05       54     4.41       55     4.05       52     9.13       94     6.27       52     9.13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 59     3.11       36     3.46       36     3.46       37     3.46       38     3.46       39     1.90       31     3.46       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       34     4.05       53     4.05       53     4.05       54     4.05       55     4.05       56     9.1       57     4.05       58     4.05       52     9.1       54     4.05       55     4.05       56     9.1       57     4.05       58     6.25       59     6.26       50     13.0       50     13.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 59     3.11       36     3.23       36     3.46       37     3.46       39     3.46       39     3.46       39     3.46       30     3.46       31     53       32     2.57       33     2.57       34     6.73       35     4.06       36     6.27       37     7.47       37     7.47       37     5.0       38     6.73       39     6.26       30     13.0       31     6.27       32     5.57       33     2.57       34     9.4       36     6.27       37     9.4       36     4.06       37     9.4       38     6.24       39     2.43       30     13.0       30     2.43       30     2.43       30     2.43       30     2.43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 59     3.11       36     3.13       36     3.46       39     4.29       39     3.46       30     3.46       31     3.46       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       34     4.05       35     4.06       36     6.27       37.15     7.47       37.15     7.47       38     4.09       39     4.09       31.15     7.0       31.15     7.0       32.15     5.25       38     4.41       39     6.22       30     13.0       31.6     2.4.05       31.6     2.4.05       32     4.06       33     2.4.05       34     4.94       35     4.06       36     2.4.3       37     2.4.3       38     4.06       36     2.4.3       37     2.4.3       36     2.4.3       37     2.4.3       38     2.4.3       36     2.4.3 <t< td=""><td>59     3.11       36     3.46       36     3.46       37     3.46       38     3.46       39     1.90       31     5.73       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       34     4.08       53     4.09       54     4.14       55     4.06       56     2.4.3       57     4.06       58     4.44       59     6.26       51     4.06       52     9.13       94     4.3.4       6     24.3       6     24.3       6     24.0       6     24.0</td><td>59     3.11       36     3.23       36     3.46       37     3.46       39     3.46       31     3.46       33     3.46       33     2.57       33     2.57       33     2.57       34     4.09       35     4.09       36     6.25       37     7.47       38     4.41       39     6.25       30     1.30       31     6.25       32     5.20       31     6.25       32     5.20       31     6.25       32     5.20       31     6.25       32     5.20       31     6.25       33     5.20       34     4.41       35     4.06       36     4.41       37     4.06       36     24.3       37     24.3       38     24.3       39     24.3       30     24.3       31     6.25       31     5.2       32     24.3       33     24.3       34     24.3       35     24.3&lt;</td><td>59     3.11       36     3.23       36     3.46       37     5.45       38     3.23       39     3.46       39     1.90       30     3.46       31     3.46       33     2.57       33     2.57       33     2.57       34     6.27       35     4.06       36     5.73       37     4.06       38     4.41       36     5.27       37     4.06       36     24.30       37     4.06       38     4.41       39     6.26       30     13.0       314     4.06       36     24.30       37     4.06       38     4.41       39     24.30       30     24.30       30     24.30       30     24.30       30     24.30       316     24.30       36     24.30       37     24.30       38     24.30       38     28.8       38     28.8       38     28.8  </td></t<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 59     3.11       36     3.46       36     3.46       37     3.46       38     3.46       39     1.90       31     5.73       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       33     2.57       34     4.08       53     4.09       54     4.14       55     4.06       56     2.4.3       57     4.06       58     4.44       59     6.26       51     4.06       52     9.13       94     4.3.4       6     24.3       6     24.3       6     24.0       6     24.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 59     3.11       36     3.23       36     3.46       37     3.46       39     3.46       31     3.46       33     3.46       33     2.57       33     2.57       33     2.57       34     4.09       35     4.09       36     6.25       37     7.47       38     4.41       39     6.25       30     1.30       31     6.25       32     5.20       31     6.25       32     5.20       31     6.25       32     5.20       31     6.25       32     5.20       31     6.25       33     5.20       34     4.41       35     4.06       36     4.41       37     4.06       36     24.3       37     24.3       38     24.3       39     24.3       30     24.3       31     6.25       31     5.2       32     24.3       33     24.3       34     24.3       35     24.3<                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 59     3.11       36     3.23       36     3.46       37     5.45       38     3.23       39     3.46       39     1.90       30     3.46       31     3.46       33     2.57       33     2.57       33     2.57       34     6.27       35     4.06       36     5.73       37     4.06       38     4.41       36     5.27       37     4.06       36     24.30       37     4.06       38     4.41       39     6.26       30     13.0       314     4.06       36     24.30       37     4.06       38     4.41       39     24.30       30     24.30       30     24.30       30     24.30       30     24.30       316     24.30       36     24.30       37     24.30       38     24.30       38     28.8       38     28.8       38     28.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |         |         |         |         |                    |                               | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
| сb                 | t CA -29.   | CA -41      | t CA -76   |                                | k CA -15                                  | t CA -15 <sup>1</sup><br>t CA -33                    | <ul> <li>CA -15</li> <li>CA -33</li> <li>CA -33</li> <li>CA -27</li> </ul>                                                                    | <ul> <li>CA -15</li> <li>CA -33</li> <li>CA -33</li> <li>CA -27</li> <li>CA -10</li> </ul>                                                                                              | CA -15:<br>CA -33<br>CCA -33<br>CCA -10<br>CCA -10<br>CCA -4:                                                                                         | <ul> <li>CA -15</li> <li>CA -33</li> <li>CA -37</li> <li>CA -27</li> <li>CA -10</li> <li>CA -10</li> <li>CA -33</li> <li>CA -33</li> <li>CA -34</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ul> <li>CA -15:</li> <li>CA -33:</li> <li>CA -37:</li> <li>CA -27:</li> <li>CA -27:</li> <li>CA -46:</li> <li>CA -36:</li> &lt;</ul> | 15:       15:       15:       15:       15:       16:       17:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17: </td <td><ul> <li>CA -15:</li> <li>CA -33:</li> <li>CA -27:</li> <li>CA -27:</li> <li>CA -10:</li> <li>CA -45:</li> <li>CA -35:</li> <li>CA -35:</li> <li>CA -35:</li> <li>CA -35:</li> <li>CA -37:</li> &lt;</ul></td> <td>15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:   <!--</td--><td>15:       15:       15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:   <!--</td--><td>15:     -33:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:</td><td>15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:   <!--</td--><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>10     10       10     12       11     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       13     12       14     12       15     12       16     27       17     27       18     27       17     27       18     27       19     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       27</td><td>1000     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100    
271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101<td>126     -33       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       121     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       123     -27       124     -28       125     -27       126     -28       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       123     -27       124     -27</td><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274</td><td>15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2:      <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08        
10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<></td></td></td></td></td></td></td> | <ul> <li>CA -15:</li> <li>CA -33:</li> <li>CA -27:</li> <li>CA -27:</li> <li>CA -10:</li> <li>CA -45:</li> <li>CA -35:</li> <li>CA -35:</li> <li>CA -35:</li> <li>CA -35:</li> <li>CA -37:</li> &lt;</ul> | 15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17: </td <td>15:       15:       15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:   <!--</td--><td>15:     -33:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:</td><td>15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:   <!--</td--><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:     
 1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>10     10       10     12       11     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       13     12       14     12       15     12       16     27       17     27       18     27       17     27       18     27       19     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       27</td><td>1000     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101<td>126     -33       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       121     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       123     -27       124     -28       125     -27       126     -28       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       123     -27       124     -27</td><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274</td><td>15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2:      <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<></td></td></td></td></td></td> | 15:       15:       15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17: </td <td>15:     -33:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:</td> <td>15: 
     15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:   <!--</td--><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>10     10       10     12       11     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       13     12       14     12       15     12       16     27       17     27       18     27       17     27       18     27       19     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       27</td><td>1000     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101<td>126     -33       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       121     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       123     -27       124     -28       125     -27       126     -28       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       123     -27       124     -27</td><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274</td><td>15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2:      <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6      
6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<></td></td></td></td></td> | 15:     -33:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:      
1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:     10:       1:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15:       15:       16:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:      
17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17:       17: </td <td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td><td>10     10       10     12       11     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       13     12       14     12       15     12       16     27       17     27       18     27       17     27       18     27       19     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       27</td><td>1000     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101<td>126     -33       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       121     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       123     -27       124     -28       125     -27       126     -28       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       123     -27       124     -27</td><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274</td><td>15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2:      <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6 
     6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<></td></td></td></td> | 15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:   
 1:       1:     1:       1: <td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td> <td>13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:</td> <td>10     10       10     12       11     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       13     12       14     12       15     12       16     27       17     27       18     27       17     27       18     27       19     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       27</td> <td>1000     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101<td>126     -33       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       121     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       123     -27       124     -28       125     -27       126     -28       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       123     -27       124     -27</td><td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274</td><td>15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2:      <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<></td></td></td> | 13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 13:     -3:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10     10       10     12       11     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       12     12       13     12       14     12       15     12       16     27       17     27       18     27       17     27       18     27       19     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       10     27       27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1000     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     1000       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101     271       101 <td>126     -33       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       121     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       123     -27       124     -28       125     -27       126     -28       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       123     -27       124     -27</td> <td>15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:<td>100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274</td><td>15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2:      <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<></td></td> | 126     -33       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       121     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       122     -27       123     -27       124     -28       125     -27       126     -28       127     -27       128     -27       129     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       121     -27       122     -27       123     -27       124     -27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 15:     -33:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1:     1:       1: <td>100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274</td> <td>15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2:      <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<></td> | 100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     100       100     271       100     271       100     271       100     271       100     271       100     271       100     271       101     271       102     273       103     271       104     273       105     274       106     273       107     274       108     273       109     274       101     274       102     274       103     274       104     274       105     274       106     274       107     274       108     274       109     274       108     274       109     274       101     274       102     274       103     274       104     274       105     274                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15:       -33:         1:       1:         1:       1:         1:       1:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:         1:       2:   :       2: <t< td=""><td>15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::</td><td>10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10)      <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08        
10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr></td></t<> | 15:     -33:       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::       1::     1::                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         10       27(-10)         11       27(-10) <tr td=""> <tr td=""> <tr td="" td<=""></tr><tr><td></td><td>13 R</td><td>15 R</td><td>16<br/>R</td><td></td><td>17 R</td><td>17 R-<br/>19 R</td><td>17 R<br/>19 R<br/>26 R</td><td>17 R<br/>26 R<br/>29 R</td><td>17 R<br/>19 R<br/>26 R<br/>32 R<br/>32 R</td><td>17<br/>19<br/>26<br/>29<br/>8<br/>29<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8<br/>8</td><td>о з 32<br/>26<br/>32<br/>28<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7<br/>7</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>11 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td><ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul></td><td><ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul></td><td>- C C C C C C C C C C C C C C C C C C C</td><td>4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8</td><td>τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6   
   6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td></tr><tr><td></td><td>14.5.09</td><td>14.5.09</td><td></td><td>14.5.09</td><td>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08</td><td>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>14.5.09<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>10.4.08<br/>110.4.08<br/>115.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td><td>14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09</td></tr><tr><td></td><td>SA3-02</td><td>SA3-02</td><td></td><td>20-040</td><td>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02</td><td>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02<br/>583-02</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td><td>SA3-04<br/>SA3-02<br/>SA3-02<br/>SA3-02<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04<br/>SA3-04</td></tr></tr></tr> |  | 13 R    | 15 R    | 16<br>R |         | 17 R               | 17 R-<br>19 R                 | 17 R<br>19 R<br>26 R                     | 17 R<br>26 R<br>29 R                                | 17 R<br>19 R<br>26 R<br>32 R<br>32 R                | 17<br>19<br>26<br>29<br>8<br>29<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8 | о з 32<br>26<br>32<br>28<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7 | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                             | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                        | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                   | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                              | 11
10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                         | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                      | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                          | 7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                      | 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                 | <ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul> | <ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul>                                                                                     | - C C C C C C C C C C C C C C C C C C C                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8                                                                                                                                                                                                                                                                                                                                                                             | τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                     | 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                    |  | 14.5.09 | 14.5.09 |  | 14.5.09 | 14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09                | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08    | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>110.4.08<br>115.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09 |  | SA3-02 | SA3-02 |  | 20-040 | SA3-02<br>SA3-02 | SA3-02<br>SA3-02<br>SA3-02 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02 | 583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 |
SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04 |
|                    | 13 R        | 15 R        | 16<br>R    |                                | 17 R                                      | 17 R-<br>19 R                                        | 17 R<br>19 R<br>26 R                                                                                                                          | 17 R<br>26 R<br>29 R                                                                                                                                                                    | 17 R<br>19 R<br>26 R<br>32 R<br>32 R                                                                                                                  | 17<br>19<br>26<br>29<br>8<br>29<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | о з 32<br>26<br>32<br>28<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | - C C C C C C C C C C C C C C C C C C C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | 14.5.09 | 14.5.09 |         | 14.5.09 | 14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08                                       | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08                               | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 |
14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>110.4.08<br>115.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09 |  | SA3-02  | SA3-02  |  | 20-040  | SA3-02<br>SA3-02   | SA3-02<br>SA3-02<br>SA3-02    | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02     | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02      | 583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04                   | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04         | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04          | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04           | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04            | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04             | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                        | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                          | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                           | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                            | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                   | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                     | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                       | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                              | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                               | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                      | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                           |
SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                 |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | 13 R        | 15 R        | 16<br>R    |                                | 17 R                                      | 17 R-<br>19 R                                        | 17 R<br>19 R<br>26 R                                                                                                                          | 17 R<br>26 R<br>29 R                                                                                                                                                                    | 17 R<br>19 R<br>26 R<br>32 R<br>32 R                                                                                                                  | 17<br>19<br>26<br>29<br>8<br>29<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | о з 32<br>26<br>32<br>28<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | - C C C C C C C C C C C C C C C C C C C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | 14.5.09 | 14.5.09 |         | 14.5.09 | 14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08                                       | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08                               | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08 |
14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>110.4.08<br>115.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09 |  | SA3-02  | SA3-02  |  | 20-040  | SA3-02<br>SA3-02   | SA3-02<br>SA3-02<br>SA3-02    | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02     | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02      | 583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04 | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04                   | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04         | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04          | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04           | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04            | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04             | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                        | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                          | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                           | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                            | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                   | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                     | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                       | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                              | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                               | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                      | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                           |
SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                 |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    |             |             |            |                                |                                           |                                                      |                                                                                                                                               |                                                                                                                                                                                         |                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | 13 R        | 15 R        | 16<br>R    |                                | 17 R                                      | 17 R-<br>19 R                                        | 17 R<br>19 R<br>26 R                                                                                                                          | 17 R<br>26 R<br>29 R                                                                                                                                                                    | 17 R<br>19 R<br>26 R<br>32 R<br>32 R                                                                                                                  | 17<br>19<br>26<br>29<br>8<br>29<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8<br>8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | о з 32<br>26<br>32<br>28<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7<br>7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11 10 10 10 10 10 10 10 10 10 10 10 10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul> <li>Спременальний странации</li> <li>Спременальний странации</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul> <li>1 4 5 6 5 7 5 6 6 7 5 6 6 7 5 6 5 7 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 8 5 8 5 4 5 6 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | - C C C C C C C C C C C C C C C C C C C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4 4 5 6 7 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | τ       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6       6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         | | | | | | | | | | | | | | |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                 
                                                                                                                                                                                        |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | 14.5.09     | 14.5.09     |            | 14.5.09                        | 14.5.09<br>14.5.09                        | 14.5.09<br>14.5.09<br>14.5.09                        | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09                                                                                                      | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09                                                                                                                                     | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09                                                                                                   | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>14.5.09<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>10.4.08<br>110.4.08<br>115.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         110.4.08         110.4.08         110.4.08         110.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.4.08         15.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         11.5.5.09         15.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         14.5.09         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         10.4.08         110.4.08         15.5.09         15.5.09         15.5.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |
|                    | SA3-02      | SA3-02      |            | 20-040                         | SA3-02<br>SA3-02                          | SA3-02<br>SA3-02<br>SA3-02                           | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02                                                                                                          | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02                                                                                                                                          | 583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02<br>583-02                                                                                    | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                             | SA3-02<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SA3-04<br>SA3-02<br>SA3-02<br>SA3-02<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04<br>SA3-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                     |  |         |         |         |         |                    |                               |                                          |                                                     |                                                     |                                                                                                                 |                                                                                                                    |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |         |         |  |         |                    |                               |                                          |                                                     |                                                                    |                                                                              |                                                                                      |                                                                                      |                                                                                                 |                                                                                                            |                                                                                                                       |                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                                                          |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |        |        |  |        |                  |                            |                                      |                                                |                                                                    |                                                                              |                                                                    |                                                                              |                                                                                        |                                                                                                  |                                                                                                            |                                                                                                                      |                                                                                                                      |                                                                                                                                          |                                                                                                                                                    |                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                        |                                                                                                                                                                                            |                                                                                                                                                                                            |                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                          |

	ľ	F	100	10000	10200	1000	ź	-	140200	4 - 0/	190200	4 - 0/	19000	1 - 0/		140200		170200	ç	19000		1
Dat	7		204	2/0/2	21/12	2380	2	5	20/102	Jo %	20/1-02	Jo %	20620/	Jo %	0UX	201702	DZ	201 PD/	507	20050/	520	JISC.
			cps	٨	۸	٨V	mdd	mqq	206Pb		235U		238U			206Pb		235U		238U		
SA3-60 2.11.	)9 1:	9 R.C	4-4	11.46	0.92	34.85	57	231	0.0943	0.500	3.461	1.711	0.266	1.636	96.0	1514	19	1518	27	1521	4	0.48
SA3-60 2.11.	3 60	R C	4 308	22.22	1.79	69.71	110	463	0.0952	0.500	3.413	2.145	0.260	2.086	0.97	1531	19	1507	33	1490	55	2.69
SA3-60 2.11.	2 5 5	RÇ	4 -22	11.07	0.89	34.19	55	227	0.0944	0.500	3.431	1.541	0.264	1.458	0.95	1516	19	1511	24	1508	39	0.50
SA3-60 22.4.	38	R C	4 50	5.74	0.48	20.39	84	335	0.0949	0.500	3.448	0.911	0.263	0.762	0.84	1526	19	1515	14	1507	20	1.24
SA3-60 22.4.	38 5	RÇ	4 22	2.75	0.23	9.96	40	163	0.0945	0.500	3.481	0.927	0.267	0.781	0.84	1518	19	1523	15	1526	21	0.51
SA3-60 22.4.	38 E	RC	д 46	6.48	0.53	24.05	95	395	0.0944	0.500	3.403	0.910	0.261	0.760	0.84	1516	19	1505	14	1497	20	1.28
SA3-60 22.4.	38 4	Γ Γ Ο	A -16	4.27	0.35	15.42	63	253	0.0940	0.500	3.527	0.935	0.272	0.791	0.85	1509	19	1533	15	1551	52	2.81
SA3-60 22.4.	1 1	1 R C	۹ -70	5.41	0.45	19.59	80	321	0.0943	0.500	3.440	0.910	0.264	0.760	0.84	1515	19	1513	14	1513	20	0.14
SA3-60 22.4.	38 1:	5 R C/	A 18	3.65	0:30	13.32	54	219	0.0944	0.500	3.393	0.905	0.261	0.755	0.83	1516	19	1503	14	1493	20	1.50
SA3-60 22.4.	38 1	8 R C	4 -28	3.98	0.33	14.45	59	237	0.0944	0.500	3.422	0.906	0.263	0.756	0.83	1517	19	1509	14	1504	20	0.85
SA3-60 15.5.	<u> Э</u> Э а	1 RIN	1 252	17.66	1.52	75.36	508	8921	0.0947	0.597	2.653	2.954	0.203	2.893	0.98	1522	23	1315	43	1193	63	21.62
SA3-60 15.5.	<u> Э</u> 9 а.	2 RIN	1 86	7.12	0.61	23.66	205	2801	0.0950	0.508	3.467	3.801	0.265	3.767	0.99	1529	19	1520	58	1513	101	1.01
SA3-60 15.5.	<u> Э</u> 9 а;	3 RIN	1 -251	11.41	0.97	39.52	328	4678	0.0944	0.500	3.237	1.577	0.249	1.557	0.99	1516	19	1466	24	1432	40	5.54
SA3-60 15.5.	<u> Э</u>	4 RIN	1 -63	12.69	1.06	50.47	365	5975	0.0933	0.664	2.958	4.490	0.230	4.441	0.99	1493	25	1397	66	1335	106	0.62
SA7-04 23.4.	3 80	R C	4 -197	5.29	0.44	21.25	109	437	0.0952	0.500	3.501	0.909	0.267	0.759	0.83	1531	19	1528	14	1525	21	0.41
SA7-04 23.4.	38 1.	4 R C	₽ -3	2.64	0.21	10.88	55	224	0.0937	0.496	3.360	0.903	0.260	0.754	0.83	1502	19	1495	14	1491	20	0.72
SA7-04 23.4.	38 1:	2 R C	4 -235	7.56	0.62	30.68	156	631	0.0940	0.500	3.400	0.954	0.262	0.813	0.83	1509	19	1504	15	1501	22	0.52
SA7-04 23.4.	<b>3</b> 8 2;	3 R C	4 -210	3.89	0.32	16.18	80	333	0.0930	0.500	3.328	0.953	0.260	0.811	0.83	1488	19	1488	15	1487	22	0.03
SA7-04 2 <del>3.4.</del>	<del>3</del> 8 2	5 R C	4 <u>1045</u>	7 <del>15.21</del>	2.78	<del>96.11</del>	<del>314</del>	<del>1977</del>	0.2098	<u>2.193</u>	4.981	2.359	0.172	0.867	0.34	2904	#	<del>1816</del>	39	1024	<del>1</del> 6	34.73
SA7-04 23.4.	<u>3</u> 8 2	0 R C	۹ -182	6.16	0.50	26.11	127	537	0.0926	0.500	3.280	0.936	0.257	0.792	0.83	1480	19	1476	14	1474	21	0.42
SA7-04 23.4.	38 2	7 R C	4 <u>2794</u> 5	7 <u>18.97</u>	<del>5.75</del>	<u>146.29</u>	<del>392</del>	<del>3009</del>	0.3461	0.578	<u>6.741</u>	4.170	0.141	1.017	<del>0.85</del>	<del>3690</del>	<del>1</del> 8	<del>2078</del>	20	<del>852</del>	<del>1</del> 6	<u> 6.92</u>
SA7-04 23.4.	1	1 R C	٩ 141	6.68	0.55	27.38	138	563	0.0932	0.500	3.471	0.989	0.270	0.853	0.84	1492	19	1521	15	1541	23	3.32
SA7-04 23.4.	38 5	RÇ	4 268	4.85	0.39	20.29	100	417	0.0919	0.500	3.277	0.925	0.259	0.779	0.83	1466	19	1476	14	1483	21	1.18
SA7-04 23.4.	<del>3</del> 8 €	RC	4 <u>1210</u>	) <u>7.36</u>	<del>0.76</del>	<del>39.02</del>	<del>152</del>	<del>803</del>	0.1171	<del>3.761</del>	<del>3.486</del>	4.064	0.216	1.538	<del>0.37</del>	<del>1912</del>	135	<del>15</del> 24	62	1260	35	<u>34.09</u>
SA7-04 <del>23.4.</del>	<del>.</del> 24	6 R C	4 <u>943</u> 4	: <u>10.13</u>	2.25	44.54	<del>209</del>	<del>916</del>	0.2511	<del>5.575</del>	<del>9.223</del>	<u>6.449</u>	0.266	3.242	0.50	<del>3192</del>	<del>176</del>	2360	<del>112</del>	<del>1522</del>	<del>8</del> 7 <del>(</del>	52.31
SA7-04 23.4.	<del>3</del> <del>8</del> €	RC	4 4484	: <u>14.3</u> 4	1.80	88.45	296	1819	0.1422	1.830	<del>3.560</del>	2.212	0.182	1.243	0.54	2254	83	1541	34	<del>1076</del>	26	52.29
SA7-04 23.4.	<del>38</del> 6	RC	4 <del>631</del>	<del>15.33</del>	1.24	<del>90.39</del>	317	1859	0.0929	0.180	2.412	0.936	0.188	0.919	<del>0.98</del>	1486	Ł	<del>1246</del>	<del>(</del>	1112	<del>1</del> 9	<u>9</u> .14
SA7-04 23.4.	7 80	R U	155	12.48	0.98	76.98	258	1583	0.0898	0.500	2.231	0.923	0.180	0.776	0.83	1421	19	1191	13	1068	15	24.85
SA7-04 <del>23.4.</del>	<del>1</del>	7 RU	1 241	10.52	<del>0.87</del>	<u>62.02</u>	217	1275	0.0954	0.352	2.492	<del>1.261</del>	<u>0.189</u>	1.211	<del>0:06</del>	1536	<del>1</del> 3	1270	<del>18</del>	1118	25	<u>27.19</u>
SA7-04 23.4.	38 1;	9 R U	-62	11.13	0.88	50.62	230	1041	0.0917	0.500	3.100	0.920	0.245	0.772	0.83	1460	19	1433	14	1414	20	3.17

Dien			<del>45.61</del>	32.38	41.68	20.26	<del>16.36</del>	2.65	3.10	4.46	3.21	2.21	2.51	1.75	1.41	3.25	2.98	2.60	1.09	1.06	1.08	1.41	1.79	2.30	2.26	1.76	1.64	2.16	1.66	2.89	
22	2		62	23	<del>15</del>	21	<del>1</del>	34	35	33	35	34	34	38	40	38	38	35	20	20	20	20	20	20	20	20	20	20	24	24	
)HOBOC		238U	<del>1659</del>	<del>1157</del>	1029	1133	1365	1470	1462	1441	1463	1468	1460	1477	1485	1457	1468	1464	1494	1492	1495	1489	1487	1480	1477	1485	1492	1482	1494	1482	
22	2		<del>126</del>	<del>1</del> 8	<del>1</del> 7	16	4	21	22	20	22	21	21	23	24	23	23	22	1 4	19	16	15	15	1 4	18	18	1 4	16	16	16	
207Dh/		235U	<del>2368</del>	1366	<del>1293</del>	1236	1461	1486	1481	1468	1483	1481	1475	1488	1494	1477	1487	1480	1501	1499	1502	1498	1498	1494	1491	1496	1502	1496	1504	1501	
22	2		223	20	32	19	4	13	13	13	13	15	13	13	4	13	17	13	19	37	25	22	24	19	34	34	19	27	19	19	
20706/		206Pb	<del>3050</del>	1711	1764	1421	<del>1620</del>	1510	1508	1508	1511	1501	1497	1504	1506	1506	1514	1503	1511	1508	1511	1510	1514	1515	1511	1511	1517	1515	1519	1526	
C 4 C	2		<del>0.29</del>	<del>0.89</del>	<del>0.61</del>	0.88	<del>0.80</del>	0.97	0.97	0.96	0.97	0.96	0.97	0.97	0.97	0.97	0.95	0.97	0.83	0.61	0.74	0.79	0.77	0.83	0.64	0.64	0.83	0.72	0.87	0.88	
1 ~ 0/2			<del>2.146</del>	1.107	0.780	1.010	0.769	1.307	1.355	1.270	1.355	1.308	1.323	1.447	1.509	1.453	1.450	1.355	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.902	0.905	
)HOBOC		238U	<del>0.293</del>	0.197	0.173	0.192	0.234	0.256	0.255	0.250	0.255	0.256	0.254	0.258	0.259	0.254	0.256	0.255	0.261	0.260	0.261	0.260	0.259	0.258	0.257	0.259	0.260	0.258	0.261	0.259	
1~ %	2		7.288	1.231	1.181	1.127	0.861	1.354	1.400	1.317	1.400	1.366	1.369	1.488	1.557	1.495	1.520	1.399	0.901	1.235	1.009	0.947	0.978	0.901	1.171	1.181	0.901	1.045	1.032	1.034	
207Dh/		235U	<del>9.297</del>	2.841	2.574	2.379	3.218	3.321	3.299	3.247	3.306	3.300	3.276	3.331	3.353	3.283	3.325	3.297	3.385	3.376	3.389	3.372	3.372	3.355	3.343	3.362	3.390	3.362	3.400	3.384	
1~ %	2		<del>6.965</del>	<del>0.539</del>	<del>0.887</del>	0.500	0.388	0.350	0.350	0.350	0.350	0.396	0.350	0.350	0.380	0.350	0.459	0.350	0.500	0.982	0.675	0.578	0.628	0.500	0.899	0.912	0.500	0.728	0.500	0.500	
20706/		206Pb	0.2297	0.1048	0.1079	0.0898	0.099 <del>8</del>	0.0941	0.0940	0.0940	0.0942	0.0936	0.0935	0.0938	0.0939	0.0939	0.0943	0.0938	0.0941	0.0940	0.0942	0.0941	0.0943	0.0943	0.0942	0.0942	0.0944	0.0943	0.0945	0.0949	
=	5	ppm	<del>755</del>	1268	1733	1207	966	158	102	94	157	77	105	106	76	116	63	105	298	116	182	210	195	432	130	129	389	166	306	462	
á	2	ppm	200	216	261	202	<del>197</del>	36	24	22	37	18	25	25	19	28	15	25	73	28	44	51	47	104	31	31	94	40	74	110	
12811	0007	٣٧	<del>36.69</del>	<del>61.67</del>	<del>84.25</del>	58.67	46.49	23.73	15.35	14.19	23.68	11.54	15.87	15.90	11.45	17.53	9.42	15.84	12.94	5.03	7.91	9.13	8.48	18.80	5.67	5.62	16.92	7.23	16.22	24.54	
20705		٣٧	<del>1.94</del>	<del>0.0</del>	<del>1.18</del>	0.76	<del>0.83</del>	0.58	0.38	0.35	09.0	0.29	0.40	0.41	0:30	0.44	0.24	0.40	0.25	0.10	0.15	0.17	0.16	0.35	0.11	0.10	0.32	0.14	0.33	0.50	
206Dh	2 007	٣٧	<del>69.6</del>	<del>10.47</del>	<del>12.62</del>	9.77	<del>9.63</del>	7.32	4.79	4.41	7.49	3.63	5.00	5.11	3.73	5.58	2.96	4.95	3.03	1.16	1.83	2.11	1.95	4.30	1.29	1.29	3.90	1.66	4.01	5.97	
100		cps	<del>5766</del>	<del>708</del>	1295	-115	<del>197</del>	-93	50	-10	31	-246	-38	87	76	-130	-13	-66	-32	39	-58	-114	-395	-198	-380	-616	-402	-342	-241	291	
Ĕ	•		RU	RU	RU	RU	RЧ	R CA	R CA	R CA	R CA	R CA																			
٦rn	1		+	6	<del>1</del> 8	22	24	25	31	22	27	40	36	4	1	13	28	29	-	4	9	7	10	18	17	14	15	23	4	6	
Date			۵۲-04 <del>23.4.08</del>	47-04 <del>23.4.08</del>	47-04 <del>23.4.08</del>	47-04 23.4.08	47-04 2 <del>3.4.08</del>	A7-86 3.11.09	A7-86 23.4.08	A7-86 24.4.08	A7-86 25.4.08	A7-86 26.4.08	47-86 27.4.08	A7-86 28.4.08	A7-86 29.4.08	A7-86 30.4.08	47-86 1.5.08	47-86 2.5.08	47-91 22.4.08	47-91 22.4.08											

كate Zrn Tm 204 206Pb 207Pb 238U Pb U 207Pb/ 1ء% 207Pb/ 1ء% 206Pb/ 1ء% Rho ت	Zrn Tm 204 206Pb 207Pb 238U Pb U 207Pb/ 1º % 207Pb/ 1º % 206Pb/ 1º % Rho :	Tm 204 206Pb 207Pb 238U Pb U 207Pb/ 1σ% 207Pb/ 1σ% 206Pb/ 1σ% Rho	204 206Pb 207Pb 238U Pb U 207Pb/ 1a% 207Pb/ 1a% 206Pb/ 1a% Rho	206Pb 207Pb 238U Pb U 207Pb/ 1a % 207Pb/ 1a % 206Pb/ 1a % Rho	207Pb 238U Pb U 207Pb/ 1º % 207Pb/ 1º % 206Pb/ 1º % Rho :	238U Pb U 207Pb/ 1ơ% 207Pb/ 1ơ% 206Pb/ 1ơ% Rho	Pb U 207Pb/ 1σ% 207Pb/ 1σ% 206Pb/ 1σ% Rho :	U 207Pb/ 1a % 207Pb/ 1a % 206Pb/ 1a % Rho :	207Pb/ 1a% 207Pb/ 1a% 206Pb/ 1a% Rho	1σ % 207Pb/ 1σ % 206Pb/ 1σ % Rho	207Pb/ 1a% 206Pb/ 1a% Rho	1σ% 206Pb/ 1σ% Rho	206Pb/ 1σ% Rho	1o% Rho	Rho		207Pb/	20	07Pb/	2σ ;	206Pb/	2σ
cps mV mV ppm ppm 206Pb 235U 238U	cps mV mV ppm ppm 206Pb 235U 238U	cps mV mV mV ppm ppm 206Pb 235U 238U	cps mV mV mV ppm ppm 206Pb 235U 238U	mV mV mV ppm ppm 206Pb 235U 238U	mV mV ppm ppm 206Pb 235U 238U	mV ppm ppm 206Pb 235U 238U	ppm ppm 206Pb 235U 238U	ppm 206Pb 235U 238U	206Pb 235U 238U	235U 238U	235U 238U	238U	238U				206Pb		235U			238U
2.4.08 12 R CA 196 5.28 0.44 21.76 97 410 0.0942 0.500 3.365 1.017 0.259	12 R CA 196 5.28 0.44 21.76 97 410 0.0942 0.500 3.365 1.017 0.259	R CA 196 5.28 0.44 21.76 97 410 0.0942 0.500 3.365 1.017 0.259	196 5.28 0.44 21.76 97 410 0.0942 0.500 3.365 1.017 0.259	5.28 0.44 21.76 97 410 0.0942 0.500 3.365 1.017 0.259	0.44 21.76 97 410 0.0942 0.500 3.365 1.017 0.259	21.76 97 410 0.0942 0.500 3.365 1.017 0.259	97 410 0.0942 0.500 3.365 1.017 0.259	410 0.0942 0.500 3.365 1.017 0.259	0.0942 0.500 3.365 1.017 0.259	0.500 3.365 1.017 0.259	3.365 1.017 0.259	1.017 0.259	0.259	-	0.886	0.87	1511	19	1496		16	16 1486
2.4.08 11 R CA 113 3.74 0.30 15.20 69 286 0.0936 0.500 3.405 1.022 0.264	11 R CA 113 3.74 0.30 15.20 69 286 0.0936 0.500 3.405 1.022 0.264	R CA 113 3.74 0.30 15.20 69 286 0.0936 0.500 3.405 1.022 0.264	113 3.74 0.30 15.20 69 286 0.0936 0.500 3.405 1.022 0.264	3.74 0.30 15.20 69 286 0.0936 0.500 3.405 1.022 0.264	0.30 15.20 69 286 0.0936 0.500 3.405 1.022 0.264	15.20 69 286 0.0936 0.500 3.405 1.022 0.264	69 286 0.0936 0.500 3.405 1.022 0.264	286 0.0936 0.500 3.405 1.022 0.264	0.0936 0.500 3.405 1.022 0.264	0.500 3.405 1.022 0.264	3.405 1.022 0.264	1.022 0.264	0.264		0.891	0.87	1499	19	1506	16		1510
2.4.08 15 R CA 169 4.88 0.40 20.57 90 387 0.0944 0.500 3.441 1.070 0.264	15 R CA 169 4.88 0.40 20.57 90 387 0.0944 0.500 3.441 1.070 0.264	R CA 169 4.88 0.40 20.57 90 387 0.0944 0.500 3.441 1.070 0.264	169 4.88 0.40 20.57 90 387 0.0944 0.500 3.441 1.070 0.264	4.88 0.40 20.57 90 387 0.0944 0.500 3.441 1.070 0.264	0.40 20.57 90 387 0.0944 0.500 3.441 1.070 0.264	20.57 90 387 0.0944 0.500 3.441 1.070 0.264	90 387 0.0944 0.500 3.441 1.070 0.264	387 0.0944 0.500 3.441 1.070 0.264	0.0944 0.500 3.441 1.070 0.264	0.500 3.441 1.070 0.264	3.441 1.070 0.264	1.070 0.264	0.264		0.946	0.88	1517	19	1514	17	15,	12
2.4.08 17 R CA 230 4.31 0.36 18.13 79 342 0.0946 0.500 3.410 1.021 0.261	17 R CA 230 4.31 0.36 18.13 79 342 0.0946 0.500 3.410 1.021 0.261	R CA 230 4.31 0.36 18.13 79 342 0.0946 0.500 3.410 1.021 0.261	230 4.31 0.36 18.13 79 342 0.0946 0.500 3.410 1.021 0.261	4.31 0.36 18.13 79 342 0.0946 0.500 3.410 1.021 0.261	0.36 18.13 79 342 0.0946 0.500 3.410 1.021 0.261	18.13 79 342 0.0946 0.500 3.410 1.021 0.261	79 342 0.0946 0.500 3.410 1.021 0.261	342 0.0946 0.500 3.410 1.021 0.261	0.0946 0.500 3.410 1.021 0.261	0.500 3.410 1.021 0.261	3.410 1.021 0.261	1.021 0.261	0.261		0.890	0.87	1520	19	1507	16	1497	
2.4.08 19 R CA 155 4.22 0.35 17.73 77 334 0.0948 0.500 3.393 1.080 0.259	19 R.CA 155 4.22 0.35 17.73 77 334 0.0948 0.500 3.393 1.080 0.259	R CA 155 4.22 0.35 17.73 77 334 0.0948 0.500 3.393 1.080 0.259	155 4.22 0.35 17.73 77 334 0.0948 0.500 3.393 1.080 0.259	4.22 0.35 17.73 77 334 0.0948 0.500 3.393 1.080 0.259	0.35 17.73 77 334 0.0948 0.500 3.393 1.080 0.259	17.73 77 334 0.0948 0.500 3.393 1.080 0.259	77 334 0.0948 0.500 3.393 1.080 0.259	334 0.0948 0.500 3.393 1.080 0.259	0.0948 0.500 3.393 1.080 0.259	0.500 3.393 1.080 0.259	3.393 1.080 0.259	1.080 0.259	0.259		0.958	0.89	1525	19	1503	17	1487	
2.4.08 30 R CA  129  3.63  0.30  15.09  67  284  0.0945  0.500  3.376  1.031  0.259 (	30 R CA 129 3.63 0.30 15.09 67 284 0.0945 0.500 3.376 1.031 0.259 (	R CA 129 3.63 0.30 15.09 67 284 0.0945 0.500 3.376 1.031 0.259 (	129 3.63 0.30 15.09 67 284 0.0945 0.500 3.376 1.031 0.259 (	3.63 0.30 15.09 67 284 0.0945 0.500 3.376 1.031 0.259 (	0.30 15.09 67 284 0.0945 0.500 3.376 1.031 0.259 (	15.09 67 284 0.0945 0.500 3.376 1.031 0.259 (	67 284 0.0945 0.500 3.376 1.031 0.259 (	284 0.0945 0.500 3.376 1.031 0.259 (	0.0945 0.500 3.376 1.031 0.259 (	0.500 3.376 1.031 0.259 (	3.376 1.031 0.259 (	1.031 0.259 (	0.259 (	J	0.902	0.87	1518	19	1499	16	1485	5
2.4.08 31 R CA 276 4.84 0.40 20.72 89 390 0.0943 0.500 3.343 1.206 0.257 1	31 R CA 276 4.84 0.40 20.72 89 390 0.0943 0.500 3.343 1.206 0.257 1	R CA 276 4.84 0.40 20.72 89 390 0.0943 0.500 3.343 1.206 0.257 1	276 4.84 0.40 20.72 89 390 0.0943 0.500 3.343 1.206 0.257 1	4.84 0.40 20.72 89 390 0.0943 0.500 3.343 1.206 0.257 1	0.40 20.72 89 390 0.0943 0.500 3.343 1.206 0.257 1	20.72 89 390 0.0943 0.500 3.343 1.206 0.257 1.	89 390 0.0943 0.500 3.343 1.206 0.257 1.	390 0.0943 0.500 3.343 1.206 0.257 1	0.0943 0.500 3.343 1.206 0.257 1.	0.500 3.343 1.206 0.257 1.	3.343 1.206 0.257 1.	1.206 0.257 1.	0.257 1	~	.098	0.91	1514	19	1491	19	1475	2
3.5.09 11 S.CA 34 11.60 0.98 29.70 112 381 0.0950 0.350 3.899 1.315 0.298 1.	11 S.C.A 34 11.60 0.98 29.70 112 381 0.0950 0.350 3.899 1.315 0.298 1.	S CA 34 11.60 0.98 29.70 112 381 0.0950 0.350 3.899 1.315 0.298 1.	34 11.60 0.98 29.70 112 381 0.0950 0.350 3.899 1.315 0.298 1.	11.60 0.98 29.70 112 381 0.0950 0.350 3.899 1.315 0.298 1.	0.98 29.70 112 381 0.0950 0.350 3.899 1.315 0.298 1.	29.70 112 381 0.0950 0.350 3.899 1.315 0.298 1.	112 381 0.0950 0.350 3.899 1.315 0.298 1.	381 0.0950 0.350 3.899 1.315 0.298 1.	0.0950 0.350 3.899 1.315 0.298 1.	0.350 3.899 1.315 0.298 1.	3.899 1.315 0.298 1.	1.315 0.298 1.	0.298 1.1	<del>,</del>	268	0.96	1527	13	1613	21	1680	č
3.5.09 12 SCA 210 12.52 1.05 32.58 121 418 0.0944 0.350 3.684 1.131 0.283 1.	12 SCA 210 12.52 1.05 32.58 121 418 0.0944 0.350 3.684 1.131 0.283 1.	SCA 210 12.52 1.05 32.58 121 418 0.0944 0.350 3.684 1.131 0.283 1.	210 12.52 1.05 32.58 121 418 0.0944 0.350 3.684 1.131 0.283 1.	12.52 1.05 32.58 121 418 0.0944 0.350 3.684 1.131 0.283 1.0	1.05 32.58 121 418 0.0944 0.350 3.684 1.131 0.283 1.0	32.58 121 418 0.0944 0.350 3.684 1.131 0.283 1.0	121 418 0.0944 0.350 3.684 1.131 0.283 1.0	418 0.0944 0.350 3.684 1.131 0.283 1.0	0.0944 0.350 3.684 1.131 0.283 1.0	0.350 3.684 1.131 0.283 1.0	3.684 1.131 0.283 1.0	1.131 0.283 1.0	0.283 1.0		9 <i>7</i> 6	0.95	1515	13	1568	18	1607	ά
3.5.09 13 SCA 91 5.96 0.50 12.11 58 155 0.0940 0.350 4.743 1.100 0.366 1.	13 SCA 91 5.96 0.50 12.11 58 155 0.0940 0.350 4.743 1.100 0.366 1.	SCA 91 5.96 0.50 12.11 58 155 0.0940 0.350 4.743 1.100 0.366 1.	91 5.96 0.50 12.11 58 155 0.0940 0.350 4.743 1.100 0.366 1.	5.96 0.50 12.11 58 155 0.0940 0.350 4.743 1.100 0.366 1.	0.50 12.11 58 155 0.0940 0.350 4.743 1.100 0.366 1.	12.11 58 155 0.0940 0.350 4.743 1.100 0.366 1.	58 155 0.0940 0.350 4.743 1.100 0.366 1.	155 0.0940 0.350 4.743 1.100 0.366 1.	0.0940 0.350 4.743 1.100 0.366 1.	0.350 4.743 1.100 0.366 1.	4.743 1.100 0.366 1.	1.100 0.366 1.	0.366 1.	÷	043	0.95	1508	13	1775	18	2010	36
3.5.09 14 S CA -109 11.07 0.93 29.80 107 382 0.0942 0.350 3.616 1.185 0.279 1	14 SCA -109 11.07 0.93 29.80 107 382 0.0942 0.350 3.616 1.185 0.279 1	SCA -109 11.07 0.93 29.80 107 382 0.0942 0.350 3.616 1.185 0.279 1	-109 11.07 0.93 29.80 107 382 0.0942 0.350 3.616 1.185 0.279 1	11.07 0.93 29.80 107 382 0.0942 0.350 3.616 1.185 0.279 1	0.93 29.80 107 382 0.0942 0.350 3.616 1.185 0.279 1	29.80 107 382 0.0942 0.350 3.616 1.185 0.279 1	107 382 0.0942 0.350 3.616 1.185 0.279 1	382 0.0942 0.350 3.616 1.185 0.279 1	0.0942 0.350 3.616 1.185 0.279 1	0.350 3.616 1.185 0.279 1	3.616 1.185 0.279 1	1.185 0.279 1	0.279 1	-	.132	0.96	1511	13	1553	19	1584	32
3.5.09 15 SCA -69 11.47 0.96 31.24 111 401 0.0941 0.350 3.577 1.167 0.276	15 SCA -69 11.47 0.96 31.24 111 401 0.0941 0.350 3.577 1.167 0.276	SCA -69 11.47 0.96 31.24 111 401 0.0941 0.350 3.577 1.167 0.276	-69 11.47 0.96 31.24 111 401 0.0941 0.350 3.577 1.167 0.276	11.47 0.96 31.24 111 401 0.0941 0.350 3.577 1.167 0.276	0.96 31.24 111 401 0.0941 0.350 3.577 1.167 0.276	31.24 111 401 0.0941 0.350 3.577 1.167 0.276	111 401 0.0941 0.350 3.577 1.167 0.276	401 0.0941 0.350 3.577 1.167 0.276	0.0941 0.350 3.577 1.167 0.276	0.350 3.577 1.167 0.276	3.577 1.167 0.276	1.167 0.276	0.276		1.113	0.95	1511	13	1544	18	1569	31
3.5.09 18 S CA -196 6.15 0.51 12.18 59 156 0.0936 0.350 4.850 1.755 0.376	18 SCA -196 6.15 0.51 12.18 59 156 0.0936 0.350 4.850 1.755 0.376	S CA -196 6.15 0.51 12.18 59 156 0.0936 0.350 4.850 1.755 0.376	-196 6.15 0.51 12.18 59 156 0.0936 0.350 4.850 1.755 0.376	6.15 0.51 12.18 59 156 0.0936 0.350 4.850 1.755 0.376	0.51 12.18 59 156 0.0936 0.350 4.850 1.755 0.376	12.18 59 156 0.0936 0.350 4.850 1.755 0.376	59 156 0.0936 0.350 4.850 1.755 0.376	156 0.0936 0.350 4.850 1.755 0.376	0.0936 0.350 4.850 1.755 0.376	0.350 4.850 1.755 0.376	4.850 1.755 0.376	1.755 0.376	0.376		1.720	0.98	1500	13	1794	29	2057	60
3.5.09 1 S.U 65 9.21 0.78 26.39 89 338 0.0950 0.350 3.687 1.358 0.281	1 SU 65 9.21 0.78 26.39 89 338 0.0950 0.350 3.687 1.358 0.281	S U 65 9.21 0.78 26.39 89 338 0.0950 0.350 3.687 1.358 0.281	65 9.21 0.78 26.39 89 338 0.0950 0.350 3.687 1.358 0.281	9.21 0.78 26.39 89 338 0.0950 0.350 3.687 1.358 0.281	0.78 26.39 89 338 0.0950 0.350 3.687 1.358 0.281	26.39 89 338 0.0950 0.350 3.687 1.358 0.281	89 338 0.0950 0.350 3.687 1.358 0.281	338 0.0950 0.350 3.687 1.358 0.281	0.0950 0.350 3.687 1.358 0.281	0.350 3.687 1.358 0.281	3.687 1.358 0.281	1.358 0.281	0.281		1.312	0.97	1529	13	1569	21	1598	37
3.5.09 3 S.U 200 11.04 0.93 32.28 107 414 0.0951 0.350 3.656 1.420 0.279	3 SU 200 11.04 0.93 32.28 107 414 0.0951 0.350 3.656 1.420 0.279	S U 200 11.04 0.93 32.28 107 414 0.0951 0.350 3.656 1.420 0.279	200 11.04 0.93 32.28 107 414 0.0951 0.350 3.656 1.420 0.279	11.04 0.93 32.28 107 414 0.0951 0.350 3.656 1.420 0.279	0.93 32.28 107 414 0.0951 0.350 3.656 1.420 0.279	32.28 107 414 0.0951 0.350 3.656 1.420 0.279	107 414 0.0951 0.350 3.656 1.420 0.279	414 0.0951 0.350 3.656 1.420 0.279	0.0951 0.350 3.656 1.420 0.279	0.350 3.656 1.420 0.279	3.656 1.420 0.279	1.420 0.279	0.279		1.376	0.97	1530	13	1562	22	1585	39
3.5.09 4 S.U 185 7.70 0.65 24.28 74 311 0.0951 0.350 3.417 1.391 0.260 1	4 SU 185 7.70 0.65 24.28 74 311 0.0951 0.350 3.417 1.391 0.260 1	S U 185 7.70 0.65 24.28 74 311 0.0951 0.350 3.417 1.391 0.260 1	185 7.70 0.65 24.28 74 311 0.0951 0.350 3.417 1.391 0.260 1	7.70 0.65 24.28 74 311 0.0951 0.350 3.417 1.391 0.260 1	0.65 24.28 74 311 0.0951 0.350 3.417 1.391 0.260 1	24.28 74 311 0.0951 0.350 3.417 1.391 0.260 1	74 311 0.0951 0.350 3.417 1.391 0.260 1	311 0.0951 0.350 3.417 1.391 0.260 1	0.0951 0.350 3.417 1.391 0.260 1	0.350 3.417 1.391 0.260 1	3.417 1.391 0.260 1	1.391 0.260 1	0.260 1	<u>_</u>	.347	0.97	1531	13	1508	22	1492	36
3.5.09 5 S.U 184 4.81 0.40 19.56 46 251 0.0929 0.350 2.537 2.066 0.198 2	5 SU 184 4.81 0.40 19.56 46 251 0.0929 0.350 2.537 2.066 0.198 2	S U 184 4.81 0.40 19.56 46 251 0.0929 0.350 2.537 2.066 0.198 2	184 4.81 0.40 19.56 46 251 0.0929 0.350 2.537 2.066 0.198 2	4.81 0.40 19.56 46 251 0.0929 0.350 2.537 2.066 0.198 2	0.40 19.56 46 251 0.0929 0.350 2.537 2.066 0.198 2	19.56 46 251 0.0929 0.350 2.537 2.066 0.198 2	46 251 0.0929 0.350 2.537 2.066 0.198 2	251 0.0929 0.350 2.537 2.066 0.198 2	0.0929 0.350 2.537 2.066 0.198 2	0.350 2.537 2.066 0.198 2	2.537 2.066 0.198 2	2.066 0.198 2	0.198 2		2.036	0.99	1485	13	1283	30	1165	43
3.5.09 6 S.U 321 11.13 0.94 32.41 107 416 0.0949 0.350 3.643 1.116 0.278 1	6 SU 321 11.13 0.94 32.41 107 416 0.0949 0.350 3.643 1.116 0.278 1	S U 321 11.13 0.94 32.41 107 416 0.0949 0.350 3.643 1.116 0.278 1	321 11.13 0.94 32.41 107 416 0.0949 0.350 3.643 1.116 0.278 1	11.13 0.94 32.41 107 416 0.0949 0.350 3.643 1.116 0.278 1	0.94 32.41 107 416 0.0949 0.350 3.643 1.116 0.278 1	32.41 107 416 0.0949 0.350 3.643 1.116 0.278 1	107 416 0.0949 0.350 3.643 1.116 0.278 1	416 0.0949 0.350 3.643 1.116 0.278 1	0.0949 0.350 3.643 1.116 0.278 1	0.350 3.643 1.116 0.278 1	3.643 1.116 0.278 1	1.116 0.278 1	0.278 1	~	.060	0.95	1526	13	1559	18	1584	30
3.5.09 7 S.U 194 10.82 0.91 30.96 104 397 0.0945 0.350 3.691 1.407 0.283 1	7 SU 194 10.82 0.91 30.96 104 397 0.0945 0.350 3.691 1.407 0.283 1	S U 194 10.82 0.91 30.96 104 397 0.0945 0.350 3.691 1.407 0.283 1	194 10.82 0.91 30.96 104 397 0.0945 0.350 3.691 1.407 0.283 1	10.82 0.91 30.96 104 397 0.0945 0.350 3.691 1.407 0.283 1	0.91 30.96 104 397 0.0945 0.350 3.691 1.407 0.283 1	30.96 104 397 0.0945 0.350 3.691 1.407 0.283 1	104 397 0.0945 0.350 3.691 1.407 0.283 1	397 0.0945 0.350 3.691 1.407 0.283 1	0.0945 0.350 3.691 1.407 0.283 1	0.350 3.691 1.407 0.283 1	3.691 1.407 0.283 1	1.407 0.283 1	0.283 1	-	.363	0.97	1519	13	1569	22	1607	39
3.5.09 1 R.U 82 5.19 0.45 17.67 120 463 0.0950 0.350 3.548 2.091 0.271 2	1 R.U 82 5.19 0.45 17.67 120 463 0.0950 0.350 3.548 2.091 0.271 2	RU 82 5.19 0.45 17.67 120 463 0.0950 0.350 3.548 2.091 0.271 2	82 5.19 0.45 17.67 120 463 0.0950 0.350 3.548 2.091 0.271 2	5.19 0.45 17.67 120 463 0.0950 0.350 3.548 2.091 0.271 2	0.45 17.67 120 463 0.0950 0.350 3.548 2.091 0.271 2	17.67 120 463 0.0950 0.350 3.548 2.091 0.271 2	120 463 0.0950 0.350 3.548 2.091 0.271 2	463 0.0950 0.350 3.548 2.091 0.271 2	0.0950 0.350 3.548 2.091 0.271 2	0.350 3.548 2.091 0.271 2	3.548 2.091 0.271 2	2.091 0.271 2	0.271 2		2.062	66.0	1529	13	1538	33	1545	56
3.5.09 2 R.U 63 5.05 0.43 17.85 117 468 0.0964 0.360 3.423 2.620 0.258	2 RU 63 5.05 0.43 17.85 117 468 0.0964 0.360 3.423 2.620 0.258	RU 63 5.05 0.43 17.85 117 468 0.0964 0.360 3.423 2.620 0.258	63 5.05 0.43 17.85 117 468 0.0964 0.360 3.423 2.620 0.258	5.05 0.43 17.85 117 468 0.0964 0.360 3.423 2.620 0.258	0.43 17.85 117 468 0.0964 0.360 3.423 2.620 0.258	17.85 117 468 0.0964 0.360 3.423 2.620 0.258	117 468 0.0964 0.360 3.423 2.620 0.258	468 0.0964 0.360 3.423 2.620 0.258	0.0964 0.360 3.423 2.620 0.258	0.360 3.423 2.620 0.258	3.423 2.620 0.258	2.620 0.258	0.258		2.595	66.0	1555	14	1510	40	1478	68
3.5.09 9 R CA -260 5.37 0.46 16.35 124 429 0.0942 0.406 3.735 1.193 0.288	9 R.C.A -260 5.37 0.46 16.35 124 429 0.0942 0.406 3.735 1.193 0.288	R CA -260 5.37 0.46 16.35 124 429 0.0942 0.406 3.735 1.193 0.288	-260 5.37 0.46 16.35 124 429 0.0942 0.406 3.735 1.193 0.288	5.37 0.46 16.35 124 429 0.0942 0.406 3.735 1.193 0.288	0.46 16.35 124 429 0.0942 0.406 3.735 1.193 0.288	16.35 124 429 0.0942 0.406 3.735 1.193 0.288	124 429 0.0942 0.406 3.735 1.193 0.288	429 0.0942 0.406 3.735 1.193 0.288	0.0942 0.406 3.735 1.193 0.288	0.406 3.735 1.193 0.288	3.735 1.193 0.288	1.193 0.288	0.288		1.122	0.94	1512	15	1579	19	1630	32
3.5.09 11 R CA -49 6.41 0.55 19.88 149 521 0.0947 0.350 3.779 1.273 0.289 <sup>·</sup>	11 R.C.A -49 6.41 0.55 19.88 149 521 0.0947 0.350 3.779 1.273 0.289 <sup>·</sup>	R CA -49 6.41 0.55 19.88 149 521 0.0947 0.350 3.779 1.273 0.289 <sup>-</sup>	-49 6.41 0.55 19.88 149 521 0.0947 0.350 3.779 1.273 0.289	6.41 0.55 19.88 149 521 0.0947 0.350 3.779 1.273 0.289	0.55 19.88 149 521 0.0947 0.350 3.779 1.273 0.289 <sup>-</sup>	19.88 149 521 0.0947 0.350 3.779 1.273 0.289	149 521 0.0947 0.350 3.779 1.273 0.289	521 0.0947 0.350 3.779 1.273 0.289	0.0947 0.350 3.779 1.273 0.289	0.350 3.779 1.273 0.289	3.779 1.273 0.289	1.273 0.289	0.289	•	1.224	0.96	1523	13	1588	20	1638	35
3.5.09 12 R CA 11 4.80 0.41 16.00 111 419 0.0948 0.350 3.502 1.021 0.268 0.	12 R.CA 11 4.80 0.41 16.00 111 419 0.0948 0.350 3.502 1.021 0.268 0.	R CA 11 4.80 0.41 16.00 111 419 0.0948 0.350 3.502 1.021 0.268 0.	11 4.80 0.41 16.00 111 419 0.0948 0.350 3.502 1.021 0.268 0.	4.80 0.41 16.00 111 419 0.0948 0.350 3.502 1.021 0.268 0.	0.41 16.00 111 419 0.0948 0.350 3.502 1.021 0.268 0.	16.00 111 419 0.0948 0.350 3.502 1.021 0.268 0.	111 419 0.0948 0.350 3.502 1.021 0.268 0.	419 0.0948 0.350 3.502 1.021 0.268 0.	0.0948 0.350 3.502 1.021 0.268 0.	0.350 3.502 1.021 0.268 0.	3.502 1.021 0.268 0.	1.021 0.268 0.	0.268 0.3	0	959	0.94	1524	13	1528	16	1530	26
3.5.09 13 R CA -70 4.59 0.39 15.28 106 401 0.0946 0.350 3.498 1.514 0.268 1.4	13 R.CA -70 4.59 0.39 15.28 106 401 0.0946 0.350 3.498 1.514 0.268 1.4	R CA -70 4.59 0.39 15.28 106 401 0.0946 0.350 3.498 1.514 0.268 1.4	-70 4.59 0.39 15.28 106 401 0.0946 0.350 3.498 1.514 0.268 1.4	4.59 0.39 15.28 106 401 0.0946 0.350 3.498 1.514 0.268 1.4	0.39 15.28 106 401 0.0946 0.350 3.498 1.514 0.268 1.4	15.28 106 401 0.0946 0.350 3.498 1.514 0.268 1.4	106 401 0.0946 0.350 3.498 1.514 0.268 1.4	401 0.0946 0.350 3.498 1.514 0.268 1.4	0.0946 0.350 3.498 1.514 0.268 1.4	0.350 3.498 1.514 0.268 1.4	3.498 1.514 0.268 1.4	1.514 0.268 1.4	0.268 1.4	4.	173	0.97	1520	13	1527	24	1532	40
3.5.09 19 R CA -5 4.43 0.38 14.51 103 380 0.0945 0.350 3.624 2.614 0.278 2.5	19 R.CA -5 4.43 0.38 14.51 103 380 0.0945 0.350 3.624 2.614 0.278 2.5	R CA -5 4.43 0.38 14.51 103 380 0.0945 0.350 3.624 2.614 0.278 2.5	-5 4.43 0.38 14.51 103 380 0.0945 0.350 3.624 2.614 0.278 2.5	4.43 0.38 14.51 103 380 0.0945 0.350 3.624 2.614 0.278 2.5	0.38 14.51 103 380 0.0945 0.350 3.624 2.614 0.278 2.5	14.51 103 380 0.0945 0.350 3.624 2.614 0.278 2.5	103 380 0.0945 0.350 3.624 2.614 0.278 2.5	380 0.0945 0.350 3.624 2.614 0.278 2.5	0.0945 0.350 3.624 2.614 0.278 2.5	0.350 3.624 2.614 0.278 2.5	3.624 2.614 0.278 2.5	2.614 0.278 2.5	0.278 2.5	2.5	91	0.99	1517	13	1555	41	1583	72
3.5.09 20 R CA 197 3.88 0.33 13.00 90 341 0.0947 0.350 3.580 1.013 0.274 0.9	20 R CA 197 3.88 0.33 13.00 90 341 0.0947 0.350 3.580 1.013 0.274 0.9	R CA 197 3.88 0.33 13.00 90 341 0.0947 0.350 3.580 1.013 0.274 0.9	197 3.88 0.33 13.00 90 341 0.0947 0.350 3.580 1.013 0.274 0.9	3.88 0.33 13.00 90 341 0.0947 0.350 3.580 1.013 0.274 0.9	0.33 13.00 90 341 0.0947 0.350 3.580 1.013 0.274 0.9	13.00 90 341 0.0947 0.350 3.580 1.013 0.274 0.9	90 341 0.0947 0.350 3.580 1.013 0.274 0.9	341 0.0947 0.350 3.580 1.013 0.274 0.9	0.0947 0.350 3.580 1.013 0.274 0.9	0.350 3.580 1.013 0.274 0.9	3.580 1.013 0.274 0.9	1.013 0.274 0.9	0.274 0.9	0.9	50	0.94	1522	13	1545	16	1562	26
3.5.09 23 R CA 30 4.19 0.36 13.51 97 354 0.0942 0.350 3.658 1.831 0.282 1.7	23 R.CA 30 4.19 0.36 13.51 97 354 0.0942 0.350 3.658 1.831 0.282 1.7	R CA 30 4.19 0.36 13.51 97 354 0.0942 0.350 3.658 1.831 0.282 1.7	30 4.19 0.36 13.51 97 354 0.0942 0.350 3.658 1.831 0.282 1.7	4.19 0.36 13.51 97 354 0.0942 0.350 3.658 1.831 0.282 1.7	0.36 13.51 97 354 0.0942 0.350 3.658 1.831 0.282 1.7	13.51 97 354 0.0942 0.350 3.658 1.831 0.282 1.7	97 354 0.0942 0.350 3.658 1.831 0.282 1.7	354 0.0942 0.350 3.658 1.831 0.282 1.7	0.0942 0.350 3.658 1.831 0.282 1.7	0.350 3.658 1.831 0.282 1.7	3.658 1.831 0.282 1.7	1.831 0.282 1.7	0.282 1.7	1.7	97	0.98	1512	13	1562	29	1600	51
3.5.09 24 R CA 96 3.11 0.27 10.68 72 280 0.0942 0.418 3.509 1.585 0.270 1.5	24 R.CA 96 3.11 0.27 10.68 72 280 0.0942 0.418 3.509 1.585 0.270 1.5	R CA 96 3.11 0.27 10.68 72 280 0.0942 0.418 3.509 1.585 0.270 1.5	96 3.11 0.27 10.68 72 280 0.0942 0.418 3.509 1.585 0.270 1.5	3.11 0.27 10.68 72 280 0.0942 0.418 3.509 1.585 0.270 1.5	0.27 10.68 72 280 0.0942 0.418 3.509 1.585 0.270 1.5	10.68 72 280 0.0942 0.418 3.509 1.585 0.270 1.5	72 280 0.0942 0.418 3.509 1.585 0.270 1.5	280 0.0942 0.418 3.509 1.585 0.270 1.5	0.0942 0.418 3.509 1.585 0.270 1.5	0.418 3.509 1.585 0.270 1.5	3.509 1.585 0.270 1.5	1.585 0.270 1.5	0.270 1.5	<u>т</u> .	(29	0.96	1512	16	1529	25	1542	42
3.5.09 15 R CA -190 5.98 0.51 19.19 139 503 0.0944 0.350 3.689 1.111 0.283 1	15 R.C.A -190 5.98 0.51 19.19 139 503 0.0944 0.350 3.689 1.111 0.283 1	R CA -190 5.98 0.51 19.19 139 503 0.0944 0.350 3.689 1.111 0.283 1	-190 5.98 0.51 19.19 139 503 0.0944 0.350 3.689 1.111 0.283 1	5.98 0.51 19.19 139 503 0.0944 0.350 3.689 1.111 0.283 1	0.51 19.19 139 503 0.0944 0.350 3.689 1.111 0.283 1	19.19 139 503 0.0944 0.350 3.689 1.111 0.283 1	139 503 0.0944 0.350 3.689 1.111 0.283 1	503 0.0944 0.350 3.689 1.111 0.283 1	0.0944 0.350 3.689 1.111 0.283 1	0.350 3.689 1.111 0.283 1	3.689 1.111 0.283 1.	1.111 0.283 1	0.283 1	-	.054	0.95	1516	13	1569	18	1608	30

α Disc.		20 -11.99	3 -2.47	2 2.02	9 -3.17	6 -0.80	18.25	0 0.75	8 -7.93	.7 -0.90	9 5.55	5 1.02	12 7.09	1.34	5 5.92	1.06	4 -1.14	4 -0.43	4 -1.10	3 -1.58	3 -0.57	4 0.79	3 1.16	3 1.69	3 0.59	3 0.22	л 1	
)6Pb/	380	1.102	083 3	034 3	132 4	086 4	094 3	064 5	154 7	071 2	010 7	060 4	027 3	047 4	030 £	040	503 2	512 2	499 2	504 2	490 2	505 2	507 2	507 2	506 2	513 2	032 1	
2σ 20 2	7	64	23 1	22 1	35 1	31 1	33 1	35 1	50 1	19 1	54 1	31 1	25 1	28 1	38 1	22 1	16 1	16 1	18	17 1	18	16 1	18	16 1	17 1	16 1	13	
7Pb/	35U	622	074	041	120	084	179	066	125	067	029	063	053	051	051	043	496	509	492	494	486	510	515	518	509	515	620	
2σ 20	2	18	23 1	15 1	47 1	26 1	69 1	32 1	21	14	18 1	18	38 1	19 1	17 1	27 1	21 1	19 1	29 1	24 1	28 1	19 1	27 1	19 1	27 1	19	23	
7Pb/	06Pb	519	056	056	097	078	339	072	069	061	069	070	106	061	095	051	486	505	483	480	481	517	525	533	514	517	100	
20	5	99	95 1	98	90	96 1	57 1	95 1	99 1	97 1	99 1	98 1	37 1	38	99 1	33 1	35 1	37 1	76 1	31	1	37 1	1	37 1	78 1	37 1	17	
% RI		t3 0.6	56 0.9	72 0.9	§2 0.9	0.6	33 0.6	35 0.9	9.0 66	33 0.9	53 0.9	9.0 80	31 0.8	22 0.9	27 0.9	l3 0.9	33 0.8	75 0.8	39 0.7	76 0.8	32 0.7	78 0.8	1 0.7	73 0.8	20 0.7	73 0.8	8 U U	
/ 1σ'		4.0	1.65	1.67	2.3(	2.3(	1.59	2.5(	3.69	1.3	4.25	2.3(	1.68	2.13	2.92	1.6′	0.8	0.87	0.86	0.87	0.86	0.87	0.87	0.87	0.87	0.87	80	
206Pb	238U	0.302	0.183	0.174	0.192	0.184	0.185	0.179	0.196	0.181	0.170	0.179	0.173	0.176	0.173	0.175	0.263	0.264	0.262	0.263	0.260	0.263	0.263	0.263	0.263	0.265	0 173	5
1σ %		4.070	1.749	1.712	2.632	2.392	2.385	2.689	3.737	1.427	4.278	2.351	1.931	2.173	2.956	1.743	1.056	1.008	1.176	1.086	1.151	1.011	1.126	1.006	1.120	1.006	0 08	00.00
207Pb/	235U	3.938	1.879	1.788	2.014	1.907	2.195	1.858	2.027	1.861	1.754	1.849	1.820	1.816	1.815	1.794	3.363	3.419	3.347	3.356	3.322	3.425	3.445	3.458	3.421	3.445	1 755	2
1a %		0.468	0.561	0.369	1.162	0.643	1.775	0.807	0.533	0.350	0.456	0.446	0.949	0.467	0.417	0.661	0.565	0.500	0.770	0.643	0.740	0.500	0.714	0.500	0.705	0.500	0.57	2.2
207Pb/	206Pb	0.0946	0.0745	0.0745	0.0761	0.0754	0.0860	0.0751	0.0750	0.0747	0.0750	0.0751	0.0764	0.0747	0.0760	0.0743	0.0929	0.0938	0.0927	0.0926	0.0927	0.0944	0.0949	0.0952	0.0943	0.0944	0.0733	0010.0
5	mq	223	322	541	144	293	140	221	345	764	726	564	494	432	579	279	206	387	140	176	152	242	151	363	162	382	08 0	200
Pp	mdc	64	57	92	26	52	25	37	64	135	118	66	87	76	97	48	50	94	34	42	36	58	36	87	39	92	ά	2
238U	۲ س	8.52	13.45	22.63	6.02	12.26	5.84	9.24	14.43	31.94	30.34	23.58	20.66	18.07	24.20	11.64	9.65	18.11	6.55	8.25	7.09	11.33	7.05	16.96	7.60	17.86	C a	2.2
207Pb	۲ س	0.24	0.18	0.29	0.09	0.17	0.10	0.12	0.21	0.44	0.38	0.32	0.28	0.24	0.31	0.16	0.18	0.35	0.12	0.16	0.13	0.22	0.14	0.33	0.14	0.34	0.18	2.5
:06Pb	۲ ۳	2.75	2.71	4.36	1.23	2.45	1.20	1.75	3.03	6.43	5.62	4.72	4.13	3.60	4.64	2.30	2.27	4.28	1.54	1.94	1.66	2.65	1.65	3.98	1.78	4.20	с Х	2
204 2	sdo	49	-45	φ	110	-22	38	111	144	32	-73	290	117	310	175	229	62	86	180	-12	110	131	340	224	353	121	CV	1
ε		CA	CA	CA	CA	CA	CA	CA	CA	⊃	⊃		' ר	, D	י ר	- -	CA	CA	CA	CA	CA	CA -	CA	CA	CA	CA	=	<b>)</b>
- -		е К	ĸ	К	2	8	4 2	7 R	e R	R	ж Ж	R	8	*	r. R	с С	К	R	R	К	2	R	с К	¥	2	R	с С	
e Z		- -	39 2	3 60	1.	39 1;	1, 1,	.1	1;	<u> 2</u>	2 2	2	2;	<u> 2</u>	<u> </u> 26	<b>39 25</b>	1	38 5	7 80	38 5	1 1	38	11	38 1-	38 1:	38 2	р Ж	5
Date		13.5.1	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	14.5.(	) 23.4.(	23.4.(	23.4.(	23.4.(	23.4.(	23.4.(	23.4.(	23.4.(	) 23.4.(	23.4.(	11.5.0	
		SA8-45	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA8-69	SA7-130	SA7-130	SA7-130	SA7-130	SA7-130	SA7-130	SA7-130	SA7-130	SA7-130	SA7-130	SA8-19	

Disc.		2.4	2.1	-1.5	-1.8	-1.4	0.8	0.9	-0.6	-2.5	-5.0	-2.8	-4.6	-2.6	-1.0	-2.6	-3.9	1.9	-2.0	-0.3	1.2	-2.4	-1.6	1.1	2.1	0.0	0.5	-2.1	-2.8	-2.2
2α		16	23	17	29	27	25	20	20	27	23	21	29	24	27	22	29	26	32	30	33	24	32	25	24	22	27	23	21	26
206Pb/	2380	1221	1275	1343	1390	1441	1438	1442	1491	1521	1564	1533	1562	1534	1522	1548	1570	1437	1512	1489	1472	1526	1516	1476	1465	1500	1498	1074	1083	1080
2σ		15	16	14	20	18	17	14	14	17	14	13	18	16	16	13	17	16	19	18	20	14	19	15	14	13	16	16	15	17
207Pb/	0052	1232	1285	1335	1380	1433	1442	1448	1487	1506	1532	1516	1533	1518	1516	1532	1545	1448	1500	1487	1479	1511	1506	1483	1478	1500	1501	1067	1073	1072
2α		32	18	25	26	22	19	19	20	20	13	14	17	17	ი	ი	12	ი	ი	ი	6	6	6	თ	ი	6	ი	18	4	12
207Pb/	20620	1251	1302	1323	1365	1421	1449	1456	1482	1484	1489	1491	1494	1495	1506	1509	1512	1464	1482	1485	1490	1490	1492	1493	1497	1500	1505	1052	1053	1056
Rho		0.658	0.911	0.738	0.866	0.873	0.888	0.842	0.823	0.887	0.930	0.902	0.919	0.887	0.969	0.955	0.959	0.971	0.979	0.976	0.981	0.962	0.979	0.967	0.964	0.957	0.970	0.933	0.949	0.974
1a %		0.70	1.00	0.69	1.15	1.04	0.97	0.79	0.77	0.99	0.83	0.75	1.03	0.88	0.99	0.81	1.06	1.02	1.20	1.12	1.26	0.89	1.20	0.95	06.0	0.82	1.00	1.17	1.05	1.30
206Pb/	2380	0.2085	0.2187	0.2316	0.2406	0.2506	0.2498	0.2507	0.2602	0.2661	0.2745	0.2685	0.2743	0.2687	0.2663	0.2715	0.2757	0.2498	0.2644	0.2597	0.2565	0.2671	0.2651	0.2574	0.2552	0.2621	0.2615	0.1812	0.1829	0.1824
1a %		1.07	1.10	0.94	1.33	1.19	1.09	0.94	0.93	1.12	06.0	0.83	1.12	0.99	1.02	0.85	1.11	1.05	1.22	1.15	1.28	0.92	1.22	0.98	0.94	0.86	1.03	1.26	1.10	1.33
207Pb/	0052	2.364	2.546	2.725	2.893	3.102	3.139	3.161	3.327	3.405	3.522	3.449	3.527	3.458	3.448	3.522	3.580	3.163	3.381	3.325	3.293	3.428	3.407	3.308	3.289	3.382	3.384	1.859	1.877	1.874
1a %		0.81	0.45	0.63	0.67	0.58	0.50	0.51	0.53	0.52	0.33	0.36	0.44	0.46	0.25	0.25	0.31	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.45	0.35	0.30
207Pb/	201012	0.0822	0.0844	0.0853	0.0872	0.0898	0.0911	0.0914	0.0927	0.0928	0.0930	0.0932	0.0933	0.0933	0.0939	0.0941	0.0942	0.0919	0.0927	0.0928	0.0931	0.0931	0.0932	0.0932	0.0935	0.0936	0.0938	0.0744	0.0744	0.0745
	шdd	52	88	64	72	50	60	70	50	52	86	80	62	60	149	146	06	379	414	582	175	361	277	318	292	353	233	122	177	197
Pb	E dd	12	22	17	19	14	17	20	16	16	27	24	20	19	45	44	28	71	85	113	50	73	59	94	84	72	71	20	30	33
238U	È	4.6	7.9	5.7	6.5	4.4	5.4	6.3	4.5	4.7	7.7	7.2	5.6	5.4	13.3	13.0	8.0	32.3	35.3	49.7	15.0	30.8	23.7	27.2	25.0	30.2	19.9	14.1	20.4	22.7
207Pb	È	0.14	0.25	0.20	0.23	0.18	0.22	0.25	0.20	0.21	0.35	0.31	0.25	0.24	0.59	0.58	0.37	0.89	1.07	1.41	0.63	0.92	0.75	1.19	1.06	0.91	0.89	0.23	0.34	0.38
206Pb	È	1.9	3.4	2.6	3.0	2.2	2.7	3.1	2.4	2.5	4.3	3.8	3.1	2.9	7.1	6.9	4.4	10.9	13.0	17.2	7.6	11.2	9.0	14.3	12.8	11.0	10.7	3.6	5.1	5.7
204	cbs	-78	-133	-118	-132	-26	-200	7	-35	-178	175	-237	-161	5	-47	<u>ө</u>	4	66	43	-32	69-	-113	-134	35	186	275	-162	118	104	29
Ē	:	RО	RU	RU	RU	RU	RU	RU	RU	RU	RU	RU	RU	RU	R CA	R CA	R CA													
Zrn		24	5	7	35	16	13	37	46	21	36	28	с	4	16	5	15	1	6	13	26	7	7	46	45	-	38	-	17	15
Date		11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09
		SA8-19	SA8-19	SA8-32	SA8-23	SA8-23	SA8-23																							

206Pb/ 2 <sub>0</sub> Disc. 238U	300	22 0.6	1 -8.1	0.8	-1.3	-0.8	-0.7	1.3	2.0	.7	7.0	4	e	e	_	<del></del>	ŝ	8	4	~	4	4	4	ø	ø	6.	0.2	4	2	.3
206Pb/ 2σ 238U	200	22	<u>-</u>				•	•	1	9	Ŷ	Ś	<del>,</del>	5.5	3.4	5.4	15.	3.2	10.	ö	24	ю.	ς	2	2	9	1	Ó	б.	1
206Pb/ 238U			2	23	21	23	26	22	22	17	23	17	4	18	23	19	20	30	50	34	34	36	27	28	24	30	43	28	33	22
		1053	1145	1052	1075	1078	1077	1085	1096	914	1019	997	1027	988	1012	1004	1020	1230	1162	1252	1041	1329	1418	1386	1433	1383	1335	1491	1358	1342
2σ	L T	15	15	16	4	16	18	16	16	15	16	12	30	13	16	13	15	19	34	22	26	23	17	19	15	19	28	18	22	15
207Pb/ 235U	2000 1001	1055	1116	1054	1071	1075	1074	1081	1088	933	1017	1008	1031	1005	1023	1022	1081	1247	1210	1293	1156	1382	1438	1420	1450	1424	1395	1493	1416	1416
2α	0	10	20	16	10	10	14	15	19	29	13	13	40	10	10	12	10	12	30	13	27	6	6	19	6	6	24	15	19	13
207Pb/ 206Pb		1059	1060	1060	1061	1069	1070	1071	1074	979	1012	1032	1040	1043	1048	1062	1205	1278	1297	1362	1377	1466	1468	1471	1475	1485	1487	1497	1504	1530
Rho	CEO 0	0.977	0.890	0.949	0.973	0.978	0.965	0.948	0.919	0.819	0.968	0.943	0.910	0.969	0.979	0.959	0.974	0.974	0.952	0.977	0.928	0.987	0.973	0.915	0.967	0.980	0.941	0.936	0.937	0.937
1a %		1.14	0.99	1.19	1.05	1.17	1.30	1.12	1.12	1.01	1.21	0.91	2.17	0.97	1.21	1.00	1.08	1.33	2.36	1.51	1.77	1.52	1.06	1.13	0.95	1.23	1.78	1.06	1.35	06.0
206Pb/ 238U	<b>2300</b>	0.1775	0.1945	0.1772	0.1815	0.1820	0.1818	0.1834	0.1853	0.1523	0.1713	0.1672	0.1727	0.1656	0.1700	0.1685	0.1715	0.2101	0.1975	0.2144	0.1753	0.2289	0.2460	0.2399	0.2489	0.2393	0.2301	0.2602	0.2345	0.2315
1a %	1	1.17	1.11	1.25	1.08	1.20	1.35	1.19	1.22	1.23	1.25	0.97	2.38	1.00	1.24	1.05	1.10	1.37	2.47	1.55	1.91	1.54	1.09	1.23	0.98	1.25	1.89	1.13	1.44	0.96
207Pb/ 235U	1 007	1.827	2.002	1.824	1.870	1.882	1.881	1.899	1.921	1.506	1.723	1.698	1.761	1.691	1.740	1.736	1.900	2.416	2.292	2.573	2.121	2.902	3.122	3.049	3.170	3.064	2.950	3.352	3.032	3.035
1a %	10.0	0.25	0.51	0.39	0.25	0.25	0.35	0.38	0.48	0.71	0.31	0.32	0.98	0.25	0.25	0.30	0.25	0.31	0.76	0.33	0.71	0.25	0.25	0.50	0.25	0.25	0.64	0.40	0.50	0.34
207Pb/ 206Pb	2001U	0.0747	0.0747	0.0747	0.0747	0.0750	0.0750	0.0751	0.0752	0.0718	0.0729	0.0737	0.0740	0.0741	0.0742	0.0747	0.0803	0.0834	0.0842	0.0871	0.0878	0.0920	0.0920	0.0922	0.0924	0.0929	0.0930	0.0934	0.0938	0.0951
n maa		479	103	151	264	319	164	153	112	124	270	281	74	718	373	557	389	231	337	265	435	338	262	89	563	334	270	105	87	151
d Pb mga		2	18	24	44	53	27	25	19	18	47	46	12	115	63	92	67	48	99	57	75	78	64	21	143	83	61	26	21	35
238U mV		55.2	11.9	17.3	30.4	36.7	18.8	17.6	12.9	11.9	25.8	26.8	7.0	68.7	35.6	53.2	37.2	22.1	32.2	25.4	41.6	32.3	25.0	8.5	53.8	32.0	25.8	10.0	8.3	14.5
207Pb mV	A 11	0.87	0.21	0.28	0.50	0.61	0.31	0.29	0.22	0.15	0.38	0.37	0.10	0.94	0.51	0.75	09.0	0.44	0.61	0.55	0.73	0.79	0.65	0.21	1.46	0.85	0.62	0.27	0.21	0.37
206Pb mV		13.3	3.2	4.2	7.6	9.2	4.7	4.4	3.3	2.3	5.9	5.7	1.5	14.4	7.8	11.5	8.4	6.1	8.2	7.2	9.4	9.7	8.1	2.6	17.9	10.4	7.6	3.3	2.6	4.3
204 Cps	<u>s</u> ,	ო	-33	40	88	217	81	197	206	-310	221	-176	193	-21	46	146	23	120	-64	98	-91	70	278	-214	-313	-277	-272	38	252	11
Ē		R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA	R CA
Zrn	ç	26	ი	25	8	9	4	7	ณ	29	34	2	32	6	12	21	1	27	10	22	43	37	5	4	40	17	23	20	36	14
Date	1 1 00	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	11.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09
		SA8-23	SA8-23	SA8-23	SA8-23	SA8-23	SA8-23	SA8-23	SA8-23	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26	SA8-26

e e	LISC.		14.1	2.7	7.3	3.7	-2.5	-0.2	1.1	-4.4	4.0	0.9	0.7	-2.4	1.8	1.8	2.4	9.4	<del>-0.8</del>	5.4	<del>4</del> .0	000	×-20.0	-5.8	-30.9	-2.9	1.3	8.8	15.4	3.1	-1.2
c	b V		31	31	37	34	34	28	30	37	26	34	30	30	32	28	32	42	25	35	37	ç	2	10	4	13	œ	29	27	16	16
140300	20010/0	238U	1348	1556	1487	1560	1663	1627	1612	1708	1581	1634	1638	1689	1630	1631	1631	1516	1032	1555	1713		nec	495	627	502	494	729	733	863	939
ç	5		21	18	22	23	19	16	18	21	15	20	18	18	21	16	19	25	77	23	24	c	מ	œ	;	1	7	22	22	13	14
140200		235U	1436	1574	1536	1585	1645	1625	1620	1675	1610	1640	1643	1672	1643	1644	1648	1583	<del>1029</del>	1593	<del>1684</del>	L L	000	490	596	499	495	746	767	871	936
ç	5		17	6	6	28	6	6	6	16	6	12	15	4	22	10	13	6	<del>1</del> 0	26	<del>1</del> 2	5	2	1	20	14	4	21	28	17	27
140200	201702	206Pb	1570	1600	1604	1619	1622	1623	1631	1635	1647	1649	1649	1650	1660	1660	1671	1673	1023	1645	<del>1647</del>	L C	C04	468	479	488	500	800	867	891	929
940			0.941	0.976	0.984	0.853	0.978	0.968	0.973	0.945	0.965	0.965	0.932	0.939	0.886	0.967	0.951	0.987	0.983	<del>0.879</del>	<del>0.968</del>		0.909	0.973	0.937	0.970	0.933	0.973	0.947	0.922	0.812
/0 - F	% DI		1.28	1.11	1.39	1.22	1.17	0.99	1.06	1.25	0.91	1.18	1.03	1.01	1.13	0.99	1.10	1.56	1.33	1.28	1.22	6	50.1	1.06	1.20	1.31	0.85	2.07	1.98	1.00	06.0
140300	20010/2	238U	0.2325	0.2729	0.2594	0.2737	0.2942	0.2870	0.2841	0.3033	0.2780	0.2884	0.2894	0.2996	0.2877	0.2878	0.2879	0.2651	0.1736	0.2728	0.3044		0.0900	0.0799	0.1021	0.0809	0.0796	0.1197	0.1204	0.1432	0.1569
1 - 0/	% DI		1.36	1.14	1.41	1.43	1.19	1.02	1.09	1.32	0.95	1.22	1.10	1.08	1.28	1.02	1.16	1.58	<del>1.36</del>	<del>1.46</del>	1.26	0	00.1	1.08	1.28	1.35	0.91	2.13	2.09	1.09	1.11
140200		235U	3.114	3.714	3.537	3.764	4.052	3.954	3.931	4.206	3.881	4.030	4.044	4.188	4.044	4.046	4.071	3.754	1.755	<del>3.803</del>	4.250		0.744	0.621	0.798	0.635	0.628	1.086	1.128	1.357	1.514
4 - 0/	% 01		0.46	0.25	0.25	0.74	0.25	0.25	0.25	0.43	0.25	0.32	0.40	0.37	0.59	0.26	0.36	0.25	0.25	<del>0.69</del>	<del>0.31</del>		07.0	0.25	0.45	0.33	0.33	0.49	0.67	0.42	0.65
140200	201102	206Pb	0.0971	0.0987	0.0989	0.0997	0.0999	6660.0	0.1004	0.1006	0.1013	0.1013	0.1014	0.1014	0.1019	0.1020	0.1025	0.1027	0.0733	0.1011	0.1013		50CU.U	0.0564	0.0567	0.0569	0.0572	0.0658	0.0679	0.0687	0.0700
-	5	bpm	100	207	282	44	255	186	274	74	259	114	86	94	58	139	66	711	<del>511</del>	54	<del>116</del>	000	978	1301	432	789	1014	381	513	308	164
đ	2	ppm	23	58	71	12	74	54	77	22	71	32	24	27	16	40	28	188	<del>68</del>	<del>15</del>	35	ľ	Ω	103	45	64	79	44	62	43	24
1000	7300	٣٧	9.5	19.7	26.9	4.2	24.4	17.8	26.2	7.0	24.7	10.9	8.2	9.0	5.5	13.3	9.4	67.9	<u>48.9</u>	<del>5.1</del>	<del>11.</del>		12.2	101.2	33.6	61.3	78.8	29.0	39.9	21.9	11.7
10200	21/12	٣٧	0.24	0.63	0.77	0.13	0.81	09.0	0.85	0.25	0.80	0.36	0.27	0.31	0.18	0.45	0.32	2.13	0.73	<del>0.17</del>	<del>0.39</del>	1	0.47	0.56	0.24	0.35	0.43	0.28	0.40	0.27	0.15
10300	20020	٣٧	2.9	7.3	8.9	1.5	9.2	6.8	9.6	2.8	8.9	4.0	3.0	3.4	2.0	5.0	3.5	23.5	<del>11.2</del>	<del>1.9</del>	<del>4</del> .3	Ċ	4. 4	11.1	4.8	6.9	8.5	4.7	6.7	4.3	2.5
100	204	cps	182	94	159	-126	-247	261	257	38	105	82	260	-282	-191	171	107	7	-393	-374	<del>365</del>	Ļ	<del>1</del>	37	-10	-72	-335	-70	-293	-24	301
ĥ	E		R CA	R CA	R CA		D Y	RU	RU	RU	RU	R CA	RU	R CA	RU																
ľ	U 7		39	33	25	41	47	38	35	24	19	28	7	46	9	8	16	42	45	4	<del>30</del>	1	31	28r	24r	9	22	2-29	24	2-15	2-4
44	Date		12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09	12.5.09		80.0.21	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09
			SA8-26	SA8-26	<del>SA8-26</del>		12-040	SA8-27																							

Disc.		-6.0	-3.5	-2.5	3.3	1.6	-2.5	-3.1	0.9	-4.2	0.0	0.1	1.5	-1.0	1.6	-2.9	-0.6	6.5	1.1	6.4	0.4	-0.4	-0.9	2.2	7.1	-6.3	4.2	-3.0	20.3	1.0
2σ		16	14	19	13	17	14	16	20	15	16	18	15	15	13	12	18	18	19	12	19	15	18	21	20	22	19	149	40	21
206Pb/	238U	988	972	965	913	932	973	981	945	697	957	956	944	696	960	1007	995	929	988	950	1027	1046	1053	1027	066	1134	1100	1189	949	1482
2σ		17	13	21	22	13	13	22	25	13	20	17	12	14	16	14	26	21	19	12	16	1	13	18	14	19	14	94	31	13
207Pb/	235U	970	962	958	923	936	965	972	947	984	957	956	948	967	965	966	663	948	992	696	1028	1044	1050	1034	1014	1111	1116	1177	1025	1488
2σ		42	29	54	70	16	28	61	71	27	56	37	16	31	43	35	74	55	46	26	30	15	16	37	1	35	18	52	31	6
207Pb/	206Pb	931	939	941	945	947	949	952	954	956	957	957	958	960	975	979	989	993	666	1014	1031	1041	1044	1050	1066	1066	1148	1155	1190	1497
Rho		0.651	0.733	0.638	0.408	0.932	0.740	0.516	0.552	0.768	0.558	0.752	0.907	0.751	0.566	0.618	0.479	0.603	0.676	0.736	0.811	0.899	0.913	0.769	0.972	0.773	0.907	0.983	0.944	0.953
1a %		0.87	0.75	1.09	0.76	0.99	0.76	06.0	1.15	0.80	0.92	1.02	0.87	0.86	0.72	0.67	0.99	1.02	1.05	0.70	1.01	0.78	06.0	1.09	1.10	1.07	0.96	6.93	2.27	0.78
206Pb/	238U	0.1656	0.1627	0.1614	0.1522	0.1555	0.1629	0.1644	0.1579	0.1672	0.1600	0.1598	0.1577	0.1623	0.1606	0.1691	0.1669	0.1550	0.1656	0.1587	0.1727	0.1761	0.1774	0.1727	0.1660	0.1923	0.1860	0.2026	0.1586	0.2585
1o %		1.34	1.03	1.71	1.86	1.06	1.02	1.75	2.09	1.04	1.65	1.36	0.96	1.14	1.27	1.08	2.06	1.69	1.55	0.95	1.25	0.86	0.99	1.42	1.13	1.39	1.06	7.05	2.40	0.82
207Pb/	235U	1.601	1.579	1.568	1.481	1.514	1.588	1.605	1.542	1.636	1.566	1.564	1.545	1.591	1.586	1.673	1.659	1.544	1.655	1.598	1.753	1.796	1.812	1.769	1.714	1.986	2.002	2.187	1.743	3.331
1a %		1.02	0.70	1.31	1.70	0.38	0.69	1.50	1.74	0.67	1.36	06.0	0.40	0.75	1.05	0.85	1.81	1.35	1.14	0.64	0.73	0.38	0.40	0.91	0.27	0.88	0.45	1.31	0.79	0.25
207Pb/	206Pb	0.0701	0.0704	0.0704	0.0706	0.0706	0.0707	0.0708	0.0709	0.0710	0.0710	0.0710	0.0710	0.0711	0.0716	0.0718	0.0721	0.0723	0.0725	0.0730	0.0736	0.0740	0.0741	0.0743	0.0749	0.0749	0.0781	0.0783	0.0797	0.0935
∍	mqq	94	132	69	53	277	135	54	52	135	62	98	281	120	87	100	45	68	71	166	121	242	230	92	399	89	197	318	641	458
PP	mdq	15	21	1	8	42	21	6	8	22	10	15	43	19	14	16	7	10	1	25	20	41	39	15	65	16	36	53	66	117
238U	٣٧	6.7	10.0	4.9	4.0	21.5	10.3	4.1	3.7	10.2	4.7	7.6	20.0	9.3	6.6	7.6	3.2	4.9	5.5	12.6	8.6	18.4	17.5	6.5	31.0	6.3	15.3	24.7	49.8	35.6
207Pb	۳V	0.10	0.14	0.07	0.05	0.29	0.14	0.06	0.05	0.15	0.07	0.10	0.28	0.13	0.09	0.11	0.05	0.07	0.08	0.18	0.13	0.29	0.28	0.10	0.47	0.11	0.27	0.39	0.76	1.05
206Pb	۳V	1.5	2.3	1.1	0.8	4.6	2.3	0.9	0.8	2.4	1.0	1.7	4.4	2.1	1.5	1.8	0.7	1.0	1.2	2.7	2.1	4.4	4.2	1.5	7.0	1.7	3.8	5.7	10.6	12.6
204	cps	41	-128	44	-2	-181	-75	19	126	216	-22	130	-21	146	-153	244	83	118	9	-67	234	55	-209		-70	162	309	24	-314	-174
Ţ		R CA	R CA	R CA	R CA	RU	R CA	RU	R CA	RU	R CA	R CA	R CA	R CA	RU	R CA	RU	R CA	RU	RU	RU	RU								
Zrn		2-8	2-23	2-11	2-30	8	2-27	2-31	2-16	2-26	2-20	26	2-10	32b	2-24	2-25	2-12	2-6	30	2-32	2-9	2-19	2-22	2-7	35	2-3	39	23	4	7
Date		13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09
		SA8-27																												

2σ Disc.		23 -3.6	27 0.7	43 -4.2	43 12.6	35 -0.1	37 -1.5		29 0.1	29 0.1 28 1.8	29 0.1 28 1.8 42 8.6
206Pb/	238U	1557	1492	1579	1338	1613	1758	1740	1740		1639
2σ		14	17	25	28	20	21	16	16	24	
207Pb/	235U	1534	1497	1552	1414	1613	1746	1741	1755	1708	
/ 2σ		1	16	1	17	10	13	6	6	10	
207Pb	206Pb	1503	1503	1516	1531	1612	1732	1742	1772	1794	0E.A
Rho		0.945	0.918	0.982	0.968	0.976	0.961	0.968	0.966	0.982	
1a %		0.82	1.01	1.55	1.77	1.23	1.21	0.96	0.94	1.45	<del>1.</del> 0
206Pb/	238U	0.2732	0.2605	0.2775	0.2306	0.2844	0.3136	0.3098	0.3099	0.2896	<u>0.1499</u>
1a %		0.87	1.10	1.58	1.83	1.26	1.25	1.00	0.97	1.47	1.05
207Pb/	239U	3.532	3.368	3.612	3.024	3.896	4.583	4.555	4.630	4.379	<del>1.465</del>
1a %		0.28	0.44	0.30	0.46	0.28	0.34	0.25	0.25	0.28	0.26
207Pb/	206Pb	0.0937	0.0938	0.0944	0.0951	0.0994	0.1060	0.1066	0.1084	0.1097	<del>0.0709</del>
	mqq	175	121	168	233	197	114	261	213	450	<del>669</del>
Pb 4	mqq	46	30	44	55	54	34	78	63	131	<del>1</del> 00
238U	ž	13.3	8.6	11.9	18.1	14.0	8.1	20.3	15.1	35.0	<del>52.0</del>
207Pb	۶ ۳	0.41	0.25	0.38	0.50	0.49	0.33	0.80	0.62	1.37	<del>0.68</del>
206Pb	à	4.9	3.0	4.5	5.9	5.5	3.5	8.4	6.4	14.1	<del>10.8</del>
204	cps	7	163	325	198	261	57	87	112	19	424
Ē		R CA	R CA	R CA	RU	R CA	R CA	RU	R CA	RU	RU
Zrn		2-28	2-17	2-18	28c	2-14	2-13	41	2-5	25	<del>16</del>
Date		13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09	13.5.09
		SA8-27	<del>SA8-27</del>								

Table 10.4. LA-ICP-MS U-Pb data. Zrn = zircon, Tm = Treatment, R = Raster, S = Spot, CA = chemically abraded, U = untreated, cps = counts pers second, disc =  $\binom{206}{Pb}^{/238}$ U/( $\binom{207}{Pb}^{/206}$ Pb). Analyses striked through are rejected due to high common lead.

31         10         52         1.4672         0.001         0.2492         15         0         146         1         1.4672         0.001         0.2492         15         1.4673         0.001         0.2492         1.4673         0.001         0.2492         1.4673         0.001         0.23198         0.001         0.23198         0.0129         0.2419         1.4673         1.4673         0.001         0.23194         0.0129         0.23193         0.0129         1.4673         1.4673         0.0139         0.2413         0.0013         1.4673         0.0139         0.2413         0.0013         1.4673         0.0139         0.23193         0.0139         0.2413         1.467         1.4673         0.0139         0.2413         0.0013         0.1013         0.0129         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0149         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139         0.0139	L L	Jisc. A€	ge 1	lσ Tc	ot.Hf	<sup>178</sup> Hf/ <sup>177</sup> Hf	1σ%	<sup>176</sup> Hf/ <sup>177</sup> Hf	1σ%	<sup>176</sup> Yb/ <sup>177</sup> Hf	1σ%	<sup>176</sup> Lu/ <sup>177</sup> Hf	1σ%	$^{176}$ Hf/ $^{177}$ Hf $_{\rm int}$	$^{176}\mathrm{Hf}/^{177}\mathrm{Hf}_{\mathrm{ap}}$	εHf <sub>(int)</sub>	2σ	$TDM_{c}$
16         16         16         1467         0001         028194         0001         028194         0001         028194         150         028195         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150         150	.69	14	84 1	10 6	6.52	1.46727	0.0057	0.281955	0.0091	0.048922	15.02	0.001335	26.62	0.281918	0.281955	2.73	1.49	2061
7         146         0         146         0         0         0         138         0         2383         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         146         0         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146	4	6 14	84 1	10	5.66	1.46730	0.0041	0.281948	0.0098	0.045210	13.42	0.001129	26.64	0.281917	0.281948	2.68	1.50	2064
3         14         0         5         14650         0018         0.281920         00073         563         0.281930         0.281930         106         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146		.77 14	84 1	10 6	6.89	1.46649	0.0119	0.281929	0.0110	0.010968	15.14	0.001493	13.80	0.281887	0.281929	1.62	1.41	2131
46         14         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         0         146         0         146         0         0         146         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         0         146         0         146         0         146         0         146         146         0         146         146         0         146         146         0         146         146         0         146         146         146         0         146         146         146         146         146         146         146		.62 14	84 1	10 6	6.88	1.46650	0.0108	0.281892	0.0087	0.008727	16.43	0.000346	14.85	0.281882	0.281892	1.45	1.04	2142
26         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         146         0         0         146         0         0         146         0         0         146         0         146         0         0         146         0         146         0         0         0         146         0         146         0         0         147         0         146         0         0         147         0         146         0         146         0         146         0         0         147         0         146         0         146         0         146         0         146         0         146         146         0         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146         146	<b>N</b>	1.45 14	84 1	10	5.24	1.46733	0.0042	0.281989	0.0100	0.033560	12.43	0.000896	26.62	0.281964	0.281989	4.37	1.46	1956
13         16         16         146         0003         028156         00035         07303         19.69         001456         2.10         028195         2.00         106         107         106         107         106         107         106         107         106         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107         107		2.69 14	84 1	10	6.03	1.46733	0.0041	0.281934	0.0086	0.061513	20.40	0.001625	27.04	0.281889	0.281934	1.69	1.51	2127
1.1         1.44         1.6         1.4665         0.0150         0.281895         0.012         0.0129         0.0129         1.316         0.281895         0.68         1.51         2.31           3.5         1.46         0.0150         0.281835         0.0109         0.00948         146         0.028193         0.53         1.4         2.23           3.6         1.46672         0.0120         0.281932         0.0109         0.01096         1.4673         0.0129         2.81833         0.53         1.4         2.0           3.14         10         5.71         1.46673         0.0190         0.281930         0.0191         0.01919         2.8193         0.28193         0.28193         2.63         1.4         2.00           3.14         10         7.31         1.46677         0.0125         0.28193         0.028         2.8193         0.019         2.8193         2.81         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93         2.93	0	.28 14	84 1	-01 	5.61	1.46726	0.0032	0.281955	0.0089	0.057303	19.69	0.001456	27.00	0.281914	0.281955	2.60	1.50	2068
365         1484         10         649         146672         0.0102         0.281883         0.0094         14,94         0.00347         13.76         0.281893         0.33         114         220           0.18         1484         10         8.50         146680         0.0150         0.281920         0.0105         0.01056         15.81         0.281932         0.281932         0.117         14         21           0.18         1484         10         7.1         14572         0.0031         0.281950         0.00105         14.75         0.281931         0.125         15.81         0.281932         1.18         1         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231         231 </td <td>0</td> <td>.19 14</td> <td>84 1</td> <td>10</td> <td>6.69</td> <td>1.46662</td> <td>0.0150</td> <td>0.281895</td> <td>0.0124</td> <td>0.012397</td> <td>14.60</td> <td>0.001226</td> <td>13.32</td> <td>0.281860</td> <td>0.281895</td> <td>0.68</td> <td>1.51</td> <td>2191</td>	0	.19 14	84 1	10	6.69	1.46662	0.0150	0.281895	0.0124	0.012397	14.60	0.001226	13.32	0.281860	0.281895	0.68	1.51	2191
018         1434         10         850         146680         00150         0281925         0101         0281925         0281975         0281975         146         215           018         148         10         571         146727         0003         0281950         00010         0949157         18.08         0001232         13.33         0281957         0281950         146         145         146         1465         14668         00031         14.45         1465         0281931         00101         049157         147         000123         13.33         0281937         028193         149         146         14668         00031         14.45         00031         14.45         00031         14.45         00031         14.45         00031         14.45         00031         14.45         00031         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45         14.45	00	3.65 148	84 1	10	6.94	1.46672	0.0102	0.281883	0600.0	0.008948	14.94	0.000947	13.76	0.281856	0.281883	0.53	1.14	2200
018         148         10         511         14672         0003         0281950         0049         0281950         0100         049167         18.00         004156         18.00         0281951         0281952         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156         156 <t< td=""><td>Ŷ</td><td>0.18 14</td><td>84 1</td><td>3 01</td><td>8.50</td><td>1.46680</td><td>0.0150</td><td>0.281922</td><td>0.0107</td><td>0.010696</td><td>15.91</td><td>0.001752</td><td>14.60</td><td>0.281873</td><td>0.281922</td><td>1.12</td><td>1.44</td><td>2163</td></t<>	Ŷ	0.18 14	84 1	3 01	8.50	1.46680	0.0150	0.281922	0.0107	0.010696	15.91	0.001752	14.60	0.281873	0.281922	1.12	1.44	2163
0.18         148         10         7.33         1.46684         0.0037         0.281952         0.08195         1.05         0.00132         1.333         0.281952         3.05         1.05         2.040           8.31         148         10         6.50         1.46647         0.0125         0.281931         0.0105         1.475         0.001502         1.343         0.281931         1.66         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86         1.86	Ŷ	0.18 14	84 1	-01	5.71	1.46727	0.0043	0.281950	0.0100	0.049167	18.08	0.001261	26.81	0.281915	0.281950	2.62	1.56	2067
8.31         148         10         6.50         146647         00125         0.281931         0.01050         13.43         0.281889         0.281931         1.68         1.38         2.13           8.31         148         10         6.58         14674         00055         0.281943         0.0098         12.92         0.001199         26.60         0.281949         2.43         2.03           8.31         1484         10         5.31         146657         0.0037         0.281949         14.56         0.00199         13.23         0.281949         2.83         1.43         205           8.51         1486         10         5.91         146657         0.0037         0.281937         0.115         0.0126         13.24         0.281937         2.31         1.41         205           3.51         1484         10         5.41         146657         0.0194         0.12104         14.55         0.00126         13.24         0.281937         2.31         1.41         205           3.51         148         10         5.41         146657         0.0194         14.55         0.00126         13.24         0.281937         2.31         1.41         205           3.5	Ŷ	0.18 14	84 1	10	7.93	1.46684	0.0097	0.281962	0.0081	0.008121	14.62	0.001232	13.33	0.281927	0.281962	3.05	1.09	2040
8.31         148         10         6.58         1.46724         0.0055         0.281949         0.0095         15.50         0.281910         0.281949         2.43         152         2079           8.31         1484         10         7.11         146655         0.0097         0.281949         0.0090         14.54         0.00995         13.23         0.281949         2.83         1.44         205           4.60         1484         10         6.93         1.46657         0.0150         0.01528         14.56         0.001965         13.23         0.281949         2.83         14.4         205           2.613         1486         10         6.93         1.46657         0.0159         0.281940         0.01526         14.55         0.00126         13.24         0.281937         2.31         14.4         205           2.614         10         6.47         1.46657         0.0194         0.281947         0.01565         14.55         0.00156         13.24         0.281949         2.83         14.4         205           2.615         148         10         7.44         14.55         0.00109         13.29         0.281949         1.64         121         121         121	÷	8.31 14	84 1	10 6	6.50	1.46647	0.0125	0.281931	0.0107	0.010695	14.75	0.001502	13.43	0.281889	0.281931	1.68	1.38	2127
8.31         148         10         7.11         1.46655         0.0097         0.281949         0.00995         13.23         0.281949         2.83         1.14         2054           4.60         1484         10         6.93         1.46667         0.0125         0.011528         14.66         0.001086         13.32         0.281937         2.31         1.41         2034           2.63         1484         10         6.93         1.46667         0.0134         0.01158         14.65         0.001086         13.32         0.281937         2.31         1.41         2034           2.63         1484         10         6.47         1.46637         0.0134         0.01156         14.55         0.001036         13.29         0.281937         0.281937         0.281937         0.281937         2.31         1.49         2031           2.63         1484         10         7.44         14.657         0.01016         0.01026         14.657         0.0281957         0.281937         0.281936         1.516         2.31         2.31           2.63         1484         10         7.28         0.010164         14.67         0.001036         13.29         0.281937         0.214         2.32	ä	8.31 14	84 1	10	6.58	1.46724	0.0055	0.281943	0.0098	0.044069	12.92	0.001199	26.60	0.281910	0.281943	2.43	1.52	2079
4.60         148         10         6.93         1.46667         0.0125         0.281937         0.281937         2.31         1.41         2087           2.63         1484         10         6.47         1.46682         0.0194         0.281870         0.0121         0.012104         14.55         0.001276         13.24         0.281870         0.25         1.49         2251           2.63         1484         10         7.44         1.46637         0.0194         0.281916         0.0121         0.012104         14.55         0.001209         13.29         0.281837         0.281916         1.49         2351           2.63         1484         10         7.46         1.46637         0.0097         0.01241         14.67         0.001099         13.29         0.281937         0.281916         1.49         121         2130           2.44         10         7.28         1.46657         0.0144         0.281927         0.01164         14.67         0.000397         13.29         0.281932         1.24         1.23         2131         2131           2.48         10         7.07         1.46654         0.01089         15.16         0.001136         13.29         0.281932         1.27	ä	8.31 14	84 1	10	7.11	1.46655	0.0097	0.281949	0600.0	0.008947	14.54	0.000995	13.23	0.281921	0.281949	2.83	1.14	2054
2.63       1484       10       6.47       1.46682       0.0194       0.281870       0.01216       13.24       0.281837       0.281870       -0.25       149       251         2.63       1484       10       7.44       1.46637       0.0097       0.009657       14.59       0.001009       13.29       0.2819367       1.24       1.21       2130         2.45       1484       10       7.28       1.46650       0.0144       0.281957       0.001009       13.29       0.281937       0.2819367       1.21       2130         2.45       148       10       7.28       1.46659       0.0144       0.281957       0.01059       13.29       0.281937       0.281957       3.21       1.23       2030         0.28       1484       10       7.28       1.4657       0.0103       0.01069       13.29       0.281957       3.21       1.27       2132         0.28       1484       10       7.07       1.4657       0.0103       0.01069       13.29       0.281997       3.21       1.27       213       213         0.28       1484       10       7.07       0.010969       15.16       0.001199       13.83       0.281897       0.281957	4	1.60 14	84 1	10 6	6.93	1.46667	0.0125	0.281937	0.0115	0.011528	14.66	0.001086	13.32	0.281906	0.281937	2.31	1.41	2087
2.63       1484       10       7.44       1.46637       0.0097       0.009657       14.59       0.001009       13.29       0.281887       0.281916       1.64       1.21       2130         1.45       1484       10       7.28       1.46650       0.0144       0.281957       0.0102       0.010164       14.67       0.000897       13.29       0.281957       3.21       1.25       2030         0.28       1484       10       7.28       1.46650       0.0144       0.281923       0.010164       14.67       0.000897       13.29       0.281957       3.21       1.25       2030         0.28       1484       10       7.07       1.46654       0.0103       0.01196       15.16       0.01136       13.83       0.281923       1.77       1.35       2122         0.18       1484       10       7.07       1.46654       0.01036       0.01136       13.83       0.281891       0.281923       1.77       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.37       1.31       1.34       1.3		2.63 14	84 1	10 6	6.47	1.46682	0.0194	0.281870	0.0121	0.012104	14.55	0.001276	13.24	0.281834	0.281870	-0.25	1.49	2251
1.45       1484       10       7.28       1.46550       0.0144       0.281957       0.010164       14.67       0.000897       13.29       0.281957       3.21       1.25       2030         0.28       1484       10       7.07       1.46554       0.0108       0.281923       0.0110       0.010969       15.16       0.001136       13.83       0.281923       1.77       1.37       2122         0.18       10       7.07       1.46654       0.0108       0.281923       0.0110       0.001136       13.83       0.281923       1.77       1.37       2122         1484       10       1.46684       0.000061       0.023683       0.001190       0.281899       0.281999       2.04       2.04         1484       10       1.46684       0.000061       0.033863       0.001190       0.281899       2.04       2.04         1484       10       0.00071       0.00059       0.033863       0.001190       0.281899       2.04       2.04	12	2.63 14	84 1	10	7.44	1.46637	0.0097	0.281916	0.0097	0.009657	14.59	0.001009	13.29	0.281887	0.281916	1.64	1.21	2130
3.28       1484       10       7.07       1.46554       0.0108       0.281923       0.0110       0.01056       13.83       0.281991       0.281923       1.77       1.37       2122         1484       10       1.46684       0.000061       0.023683       0.001190       0.281899       0.281899       2.04       2105         1484       10       1.46684       0.000061       0.023683       0.001190       0.281899       2.04       2105         0.00071       0.00079       0.038863       0.000621       0.00060       2.04       2105	`.'	1.45 14	84 1	10	7.28	1.46650	0.0144	0.281957	0.0102	0.010164	14.67	0.000897	13.29	0.281932	0.281957	3.21	1.25	2030
1484         10         1.46684         0.000061         0.023683         0.001190         0.281899         2.04         2105           0.00071         0.00059         0.038863         0.000621         0.00060         2.12	0	0.28 14	84 1	10	7.07	1.46654	0.0108	0.281923	0.0110	0.010969	15.16	0.001136	13.83	0.281891	0.281923	1.77	1.37	2122
1484         10         1.46684         0.000061         0.023683         0.001190         0.281899         2.04         2105           0.00071         0.00069         0.038863         0.000621         0.00060         2.12																		
0.00071 0.000059 0.038863 0.000621 0.00060 2.12		14	84 1	10		1.46684		0.000061		0.023683		0.001190		0.281899		2.04		2105
						0.00071		0.000059		0.038863		0.000621		0.000060		2.12		

$TDM_{c}$	2040	1867	2088	2162	2146	2170	2005	2040	1990	2034	2116	2108	2152	2071		1715	1760	1726	1666	1719	1776	1626
2σ	1.18	1.51	1.57	1.59	1.25	1.30	1.37	1.44	1.32	1.31	1.37	1.56	1.44			1.32	1.45	1.40	1.46	1.20	1.63	1.33
εHf <sub>(int)</sub>	3.07	5.77	2.33	1.16	1.42	1.04	3.62	3.07	3.86	3.17	1.89	2.01	1.33	2.59	2.70	8.59	7.89	8.42	9.34	8.52	7.64	9.97
$^{176}\mathrm{Hf}/^{177}\mathrm{Hf}_{\mathrm{ap}}$	0.281949	0.282051		0.281910	0.281911	0.281911	0.281980	0.281956	0.281977	0.281966	0.281939	0.281967	0.281930			0.282081	0.282075	0.282074	0.282101	0.282071	0.282092	0.282121
$^{176}$ Hf/ $^{177}$ Hf $_{\rm int}$	0.281926	0.282003	0.281905	0.281872	0.281880	0.281869	0.281942	0.281926	0.281948	0.281929	0.281893	0.281896	0.281877	0.281913	0.000076	0.282059	0.282039	0.282054	0.282080	0.282057	0.282032	0.282098
1σ%	26.61	26.70	13.23	13.60	13.28	13.27	26.60	27.84	26.70	26.62	13.52	13.26	13.99			26.70	26.72	26.69	26.62	26.79	26.68	26.70
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.000822	0.001737	0.001898	0.001327	0.001099	0.001477	0.001371	0.001065	0.001028	0.001327	0.001627	0.002503	0.001869	0.001473	0.000908	0.000770	0.001246	0.000694	0.000729	0.000485	0.002082	0.000805
1σ%	12.71	14.01	14.55	14.99	14.60	14.63	12.92	35.71	16.32	12.76	14.94	14.57	15.06			13.68	16.00	21.23	14.38	17.08	21.83	13.07
$^{176}$ Yb/ $^{177}$ Hf	0.032150	0.066033	0.012102	0.012991	0.009008	0.009008	0.054330	0.041773	0.041141	0.054414	0.010427	0.011245	0.010696	0.028240	0.041785	0.027010	0.046085	0.021990	0.025687	0.016074	0.072174	0.027609
1σ%	0.0087	0.0096	0.0121	0.0130	0.0099	0.0099	0.0091	0.0105	0.0096	0.0087	0.0104	0.0113	0.0107			0.0098	0.0098	0.0108	0.0113	0.0093	0.0093	0.0098
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.281949	0.282051	0.281959	0.281910	0.281911	0.281911	0.281980	0.281956	0.281977	0.281966	0.281939	0.281967	0.281930	0.281954	0.000077	0.282081	0.282075	0.282074	0.282101	0.282071	0.282092	0.282121
1σ%	0.0053	0.0072	0.0137	0.0188	0.0137	0.0150	0.0047	0.0049	0.0036	0.0037	0.0188	0.0125	0.0114			0.0047	0.0044	0.0049	0.0056	0.0048	0.0047	0.0053
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46730	1.46725	1.46659	1.46675	1.46686	1.46652	1.46725	1.46727	1.46725	1.46729	1.46656	1.46640	1.46666	1.46692	0.00071	1.46719	1.46717	1.46714	1.46721	1.46718	1.46719	1.46721
Tot.Hf	7.20	5.89	6.02	5.78	6.05	6.65	5.25	6.13	5.41	5.27	6.60	5.64	6.01			6.22	5.54	7.74	5.48	5.31	6.63	5.67
1σ	4	4	4	4	4	4	4	4	4	4	4	4	4	4		9	9	9	9	9	9	9
Age	1486	1486	1486	1486	1486	1486	1486	1486	1486	1486	1486	1486	1486	1486		1521	1521	1521	1521	1521	1521	1521
Disc.	2.54	-0.98		-4.29	2.31	5.43	-0.75	2.50	0.57	-0.07	6.47	6.03	-0.37			1.84	-1.22	-0.80	-0.69	-1.93	-1.27	2.72
Zircon	10.8	9.3	10.3	10.4	10.7	10.9	9.15	10.2	10.6	9.1	9.5	9.7	9.8	n=13		Ч	ŝ	4	5	∞	6	14
Sample	MM2241		MM36631																			

| 1683     | 1709                                                                                                                      |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1934                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1907                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1916                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1929                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1986                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1898                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1928                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2186                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                               | 2082                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2076                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2144                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2135                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2291                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2048                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2094                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.18     |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                               | 0.97                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.88                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 9.07     | 8.68                                                                                                                      | 1.53                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.85                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 5.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4.94                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                               | 2.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2.49                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -0.88                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2.94                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.282091 |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.282031                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.282042                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.282033                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.282031                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281995                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.282030                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281880                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                               | 0.281927                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.281927                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281908                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281932                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281903                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281832                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281941                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281919                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.282073 | 0.282062                                                                                                                  | 0.000043                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.281971                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.281983                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.281979                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.281973                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281948                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.281986                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.281973                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.000028                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281862                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                               | 0.281908                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.281911                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281881                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281913                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281885                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281816                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281923                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281903                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 26.61    |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 26.65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 26.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 26.87                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 26.63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 27.07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 26.64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 26.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                               | 26.61                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 26.61                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 26.64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 26.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 26.89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 26.73                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 26.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 26.75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.000643 | 0.000932                                                                                                                  | 0.001027                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.002146                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.002114                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.001934                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.002076                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.001684                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.001552                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.001918                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.000493                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.000649                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                               | 0.000683                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.000597                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.000985                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.000680                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.000672                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.000602                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.000644                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.000596                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 13.83    |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 15.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 26.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 30.52                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 16.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 28.48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 13.76                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                               | 4.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2.43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 8.43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 12.86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.022347 | 0.032372                                                                                                                  | 0.036585                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.091332                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.075220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.071633                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.084676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.058417                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.062278                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.073926                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.025325                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.028570                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                               | 0.030398                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.022482                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.040215                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.031853                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.032840                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.023339                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.027316                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.024382                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.0087   |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.0082                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.0100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0118                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.0108                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0063                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                               | 0.0066                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0057                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0049                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0054                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0063                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0082                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0057                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0054                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.282091 | 0.282089                                                                                                                  | 0.000034                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.282031                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.282042                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.282033                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.282031                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281995                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.282030                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.282027                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.000033                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281880                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                               | 0.281927                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.281927                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281908                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281932                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281903                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.281832                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281941                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.281919                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.0056   |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0066                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.0049                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.0058                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0068                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0069                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.0061                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0056                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                               | 0.0037                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0036                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0027                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0028                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0034                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0026                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0039                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.0039                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.46725  | 1.46719                                                                                                                   | 0.00006                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.46726                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.46724                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.46726                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.46723                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.46727                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.46721                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.46725                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.00005                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.46725                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                               | 1.46725                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.46727                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.46722                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.46726                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.46725                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.46730                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.46727                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.46728                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 5.46     |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6.39                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 8.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 6.16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5.32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7.19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6.72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                               | 7.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 7.22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6.75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7.42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7.52                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7.67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6.99                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 9        | 9                                                                                                                         |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ٢                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ٢                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ٢                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ٢                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ٢                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ٢                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                               | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1521     | 1521                                                                                                                      |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         
                                                                                                                                                                                                               | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 0.98     |                                                                                                                           |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -3.57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -1.31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -1.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        
                                                                                                                                                                                                               | -2.22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.34                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -0.63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 15       | n=8                                                                                                                       |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ŝ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ß                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ∞                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 9=u                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ŝ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            
                                                                                                                                                                                                               | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| MM36631  | MM36631                                                                                                                   |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MM36676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | MM36676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | MM36676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | MM36676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | MM36676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | MM36676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | MM36676                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      
                                                                                                                                                                                                               | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Ro-102b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|          | MM36631 15 0.98 1521 6 5.46 1.46725 0.0056 0.282091 0.0087 0.022347 13.83 0.000643 26.61 0.282073 0.282091 9.07 1.18 1683 | MM36631 15 0.98 1521 6 5.46 1.46725 0.0056 0.282091 0.0087 0.022347 13.83 0.000643 26.61 0.282073 0.282091 9.07 1.18 1683<br>MM36631 n=8 1521 6 1.46719 0.282089 0.032372 0.000932 0.282062 8.68 1709 | MM36631         15         0.98         1521         6         5.46         1.46725         0.0056         0.282091         0.07         13.83         0.000643         26.61         0.282091         9.07         1.18         1683           MM36631         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM36631         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM36631         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM36631         n=8         1521         6         0.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709 | MM3631         15         0.98         1521         6         5.46         1.46725         0.0056         0.282091         0.00643         26.61         0.282073         0.282091         9.07         1.18         1683           MM36631         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM36631         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM36631         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM36631         n=8         1521         6         0.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM3663         n=8         1521         6         0.46719         0.385585         0.000032         0.000033         1.53         1.53 | MM3631         15         0.38         1521         6         5.46         1.46725         0.0056         0.282091         0.00643         26.61         0.282073         0.282091         9.07         1.18         1683           MM3651         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         26.61         0.282062         8.68         1709           MM3651         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709           MM3651         n=8         1521         6         0.46719         0.282089         0.032372         0.000932         0.282062         8.68         173           MM3656         1495         7         0.000034         0.01027         0.000043         0.02146         26.65         0.281971         0.78         163         173 | MM36531         15         0.98         15.21         6         1.46719         0.0056         0.282091         1.3.83         0.000643         26.61         0.282073         0.282091         9.07         1.18         1683           MM36531         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.282062         8.68         1709         16.8         1709           MM36631         n=8         1521         6         1.46719         0.282089         0.032372         0.000932         0.000043         9.07         1.18         1683           MM3665         1521         6         0.036585         0.036585         0.001027         0.000043         1.56         0.282062         1.57         1.57           MM36676         3         0.19         1497         0.00066         0.282031         0.015         1.500         0.000146         1.677         1.53         1.53           MM36676         3         0.35         1.500         0.002146         26.56         0.282031         4.85         1.77         1934           MM36676         4         -3.57         1.46724         0.0043         0.282042         0.282032         4.85 | MM36631         15         0.98         15/21         6         5.46         1.46725         0.0056         0.282031         13.83         0.000643         26.61         0.282031         9.07         1.18         1683           MM36631         n=8         1521         6         1.46719         0.282089         0.033372         0.000932         26.61         0.282062         9.07         1.18         1683           MM36631         n=8         1521         6         1.46719         0.282089         0.033372         0.000932         0.000932         0.282062         8.68         1709           MM36676         3         0.19         1495         7         6.39         0.282031         0.0105         0.031322         15.00         0.000043         6.65         0.281071         9.07         1.86         1709           MM36676         3         0.19         1495         7         8.92         0.0052         0.005214         26.92         0.281939         0.282042         5.27         154         193           MM36676         4         -3.57         1495         7         6.16         0.052202         26.92         0.00114         26.92         0.281939         0.282042         5. | MM36631         15         0.38         1.46715         0.0056         0.282091         0.382073         0.282091         0.07         1.18         1683           MM36631         n=8         1521         6         1.46719         0.0056         0.282091         0.0337         0.000332         0.282062         0.282091         9.07         1.18         1683           MM36631         n=8         1521         6         1.46719         0.000034         0.282062         0.282062         8.68         1.59         1.59           MM36676         3         0.19         1495         7         6.39         1.46726         0.0066         0.282031         0.01027         0.000147         0.282031         1.50           MM36676         3         0.19         1495         7         0.0049         0.282031         0.0105         0.001247         0.282031         4.85         1.77         1.53           MM36676         3         0.13         15.00         0.00134         26.87         0.281979         0.282031         4.85         1.77         153           MM36676         4         3.35         0.01033         15.00         0.00134         26.87         0.281979         0.282033 | MM36631         15         0.98         1.467         1.46715         0.0055         0.282091         0.183         0.000643         26.61         0.282091         9.07         1.18         168           MM36631         n=8         1521         6         1.46719         0.0055         0.282082         0.000932         0.282062         8.68         1.70           MM36631         n=8         1521         6         1.46719         0.282089         0.00032         0.000032         0.282062         8.68         1.70           MM36676         3         0.19         1495         7         6.39         1.46724         0.0063         0.282031         0.00127         0.00043         26.65         0.281979         9.67         1.70           MM36676         3         0.19         14672         0.0063         0.282031         0.0114         26.92         0.281979         0.282033         5.13         1.70           MM36676         5         1.31         1495         7         8.68         0.01054         26.63         0.281979         0.282033         5.13         1.71         194           MM36676         5         1.31         1495         7         8.0068         0.282033 </td <td>MM36531         15         0.38         1.46715         0.0055         0.282091         0.566         0.282091         0.016         0.282095         0.282091         0.01         1.18         163           MM36631         n=8         1521         6         1.46719         0.0056         0.282089         0.00032         0.00032         0.000032         0.282069         9.07         1.46           MM36631         n=8         1521         6         1.46719         0.00003         0.282089         0.000032         0.000032         0.00003         0.282062         1.77         1.70           MM36676         3         0.19         1495         7         6.39         1.46724         0.0003         0.282031         15.00         0.001027         0.281093         0.28103         1.77         193           MM36676         3         1.31         1495         7         6.16         0.0053         2.610         0.02144         2.652         0.281033         0.28103         1.77         193           MM36676         5         1.31         1495         7         6.16         0.0053         2.613         0.01643         2.613         0.281033         0.28103         1.77         193     <td>Mindedial is 0.38 is 151 6 5.46 1.46725 0.0056 0.282091 0.0087 0.023147 13.83 0.000643 26.61 0.282091 0.282091 9.07 1.8 163     Mindedial is 1521 6 1.46719 0.00063 0.282089 0.032372 0.03092 0.282082 1.53     Mindedial is 1521 1.5 1.00006 0.146719 0.020034 0.036585 0.000102 0.000043 1.53     Mindedial is 1521 1.45 1.46719 0.00064 0.282031 0.0103 0.03537 0.000043 1.53     Mindedia is 153 1.45 1.46719 0.0006 0.282031 0.0103 0.03537 0.00102 0.00102 1.5     Mindedia is 153 1.45 1.45 1.4571 0.0006 0.282031 0.0103 0.03132 1.50 0.001034 0.02146 0.282031 0.282031 0.15     Mindedia is 1.31 1.45 7 8.32 1.46724 0.004 0.282031 0.0103 0.07163 3.052 0.00134 0.281     Mindedia is 1.31 1.45 7 5.32 1.46724 0.0058 0.282033 0.0100 0.07163 3.052 0.00134 0.281     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0068 0.282031 0.0103 0.07163 0.281939 0.282033 0.282033 0.282043 0.280     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0058
0.282033 0.0100 0.07163 3.052 0.00134 0.281939 0.282033 0.282043 0.28     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0058 0.282031 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.282033 0.19     Mindedia is 1.31 1.45 7 1.49 1.4672 0.0069 0.281959 0.0103 0.058417 2.848 0.001684 0.28193 0.282033 0.282034 0.18     Mindedia is 1.31 1.45 7 1.49 1.4672 0.0069 0.281959 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.282034 0.18     Mindedia is 1.31 1.45 7 1.45 1.4571 0.0069 0.282030 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.180     Mindedia is 1.31 1.455 7 1.45 1.4571 0.0069 0.282030 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.180     Mindedia is 1.17 1.455 7 1.45 1.4571 0.0069 0.281959 0.0103 0.05218 1.5.14 0.00184 0.281959 0.282030 0.180     Mindedia is 1.55 0.001934 0.0118 0.281959 0.281959 0.180     Mindedia is 1.55 0.001934 0.0118 0.028193 0.281959 0.180     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189</td><td>MM3651         15         0.38         15         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         <th< td=""><td>MM36531         15         0.96         15         14671         0.0051         0.00053         0.661         0.282073         0.282091         0.02         0.282093         0.03         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.00033         0.282053         0.00033         0.282053         0.282053         0.00033         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.292&lt;</td><td>Mid 36         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1<td>MAIGE         1         Col         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         1<!--</td--><td>M3661         1         0         1         6         4         6         4         6         4         6         4         6         5         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td></td></td></th<><td>M3661         15         0.54         14575         0.005         0.22303         0.00063         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.200043         0.23205         0.200043         0.23205         0.23205         0.200043         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205</td><td>M3663         15         0         14673         0.0056         0.282091         0.282091         0.282091         0.282091         0.18         1.18           M13661         1-4         1         1         1         0.00033         0.00563         0.282080         0.282091         0.01         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td><td>Modelies         is         0.066         is         0.466         0.4820         0.000643         6.66         0.282094         0.071         0.282094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.79304         0.782094         0.793         0.782094         0.793         0.782094         0.793         0.79304         0.782094         0.793         0.79304         0.793        
0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.79304         0.793         0.79304         0.793         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.793044         1.793         1.793</td><td>Maidedity         is         0.83         is         is</td><td>MA3663         15         0.56         3.46         1.4673         0.00054         0.22347         0.00053         5.61         0.22309         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303</td><td>Montioneries         Could montioneries         Councie         Councie</td></td></td> | MM36531         15         0.38         1.46715         0.0055         0.282091         0.566         0.282091         0.016         0.282095         0.282091         0.01         1.18         163           MM36631         n=8         1521         6         1.46719         0.0056         0.282089         0.00032         0.00032         0.000032         0.282069         9.07         1.46           MM36631         n=8         1521         6         1.46719         0.00003         0.282089         0.000032         0.000032         0.00003         0.282062         1.77         1.70           MM36676         3         0.19         1495         7         6.39         1.46724         0.0003         0.282031         15.00         0.001027         0.281093         0.28103         1.77         193           MM36676         3         1.31         1495         7         6.16         0.0053         2.610         0.02144         2.652         0.281033         0.28103         1.77         193           MM36676         5         1.31         1495         7         6.16         0.0053         2.613         0.01643         2.613         0.281033         0.28103         1.77         193 <td>Mindedial is 0.38 is 151 6 5.46 1.46725 0.0056 0.282091 0.0087 0.023147 13.83 0.000643 26.61 0.282091 0.282091 9.07 1.8 163     Mindedial is 1521 6 1.46719 0.00063 0.282089 0.032372 0.03092 0.282082 1.53     Mindedial is 1521 1.5 1.00006 0.146719 0.020034 0.036585 0.000102 0.000043 1.53     Mindedial is 1521 1.45 1.46719 0.00064 0.282031 0.0103 0.03537 0.000043 1.53     Mindedia is 153 1.45 1.46719 0.0006 0.282031 0.0103 0.03537 0.00102 0.00102 1.5     Mindedia is 153 1.45 1.45 1.4571 0.0006 0.282031 0.0103 0.03132 1.50 0.001034 0.02146 0.282031 0.282031 0.15     Mindedia is 1.31 1.45 7 8.32 1.46724 0.004 0.282031 0.0103 0.07163 3.052 0.00134 0.281     Mindedia is 1.31 1.45 7 5.32 1.46724 0.0058 0.282033 0.0100 0.07163 3.052 0.00134 0.281     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0068 0.282031 0.0103 0.07163 0.281939 0.282033 0.282033 0.282043 0.280     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0058 0.282033 0.0100 0.07163 3.052 0.00134 0.281939 0.282033 0.282043 0.28     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0058 0.282031 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.282033 0.19     Mindedia is 1.31 1.45 7 1.49 1.4672 0.0069 0.281959 0.0103 0.058417 2.848 0.001684 0.28193 0.282033 0.282034 0.18     Mindedia is 1.31 1.45 7 1.49 1.4672 0.0069 0.281959 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.282034 0.18     Mindedia is 1.31 1.45 7 1.45 1.4571 0.0069 0.282030 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.180     Mindedia is 1.31 1.455 7 1.45 1.4571 0.0069 0.282030 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.180     Mindedia is 1.17 1.455 7 1.45 1.4571 0.0069 0.281959 0.0103 0.05218 1.5.14 0.00184 0.281959 0.282030 0.180     Mindedia is 1.55 0.001934 0.0118 0.281959 0.281959 0.180     Mindedia is 1.55 0.001934 0.0118 0.028193 0.281959 0.180     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189</td> <td>MM3651         15         0.38         15         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         <th< td=""><td>MM36531         15         0.96         15         14671         0.0051         0.00053         0.661         0.282073         0.282091         0.02         0.282093         0.03         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.00033         0.282053         0.00033         0.282053         0.282053         0.00033         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.292&lt;</td><td>Mid 36         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1<td>MAIGE         1         Col         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         1<!--</td--><td>M3661         1         0         1         6         4         6         4         6         4         6         4         6         5         6         1         6         1         6         1         6         1         6         1         6         1  
      6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td></td></td></th<><td>M3661         15         0.54         14575         0.005         0.22303         0.00063         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.200043         0.23205         0.200043         0.23205         0.23205         0.200043         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205</td><td>M3663         15         0         14673         0.0056         0.282091         0.282091         0.282091         0.282091         0.18         1.18           M13661         1-4         1         1         1         0.00033         0.00563         0.282080         0.282091         0.01         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td><td>Modelies         is         0.066         is         0.466         0.4820         0.000643         6.66         0.282094         0.071         0.282094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.79304         0.782094         0.793         0.782094         0.793         0.782094         0.793         0.79304         0.782094         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.79304         0.793         0.79304         0.793         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.793044         1.793         1.793</td><td>Maidedity         is         0.83         is         is</td><td>MA3663         15         0.56         3.46         1.4673         0.00054         0.22347         0.00053         5.61         0.22309         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303</td><td>Montioneries         Could montioneries         Councie         Councie</td></td> | Mindedial is 0.38 is 151 6 5.46 1.46725 0.0056 0.282091 0.0087 0.023147 13.83 0.000643 26.61 0.282091 0.282091 9.07 1.8 163     Mindedial is 1521 6 1.46719 0.00063 0.282089 0.032372 0.03092 0.282082 1.53     Mindedial is 1521 1.5 1.00006 0.146719 0.020034 0.036585 0.000102 0.000043 1.53     Mindedial is 1521 1.45 1.46719 0.00064 0.282031 0.0103 0.03537 0.000043 1.53     Mindedia is 153 1.45 1.46719 0.0006 0.282031 0.0103 0.03537 0.00102 0.00102 1.5     Mindedia is 153 1.45 1.45 1.4571 0.0006 0.282031 0.0103 0.03132 1.50 0.001034 0.02146 0.282031 0.282031 0.15     Mindedia is 1.31 1.45 7 8.32 1.46724 0.004 0.282031 0.0103 0.07163 3.052 0.00134 0.281     Mindedia is 1.31 1.45 7 5.32 1.46724 0.0058 0.282033 0.0100 0.07163 3.052 0.00134 0.281     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0068 0.282031 0.0103 0.07163 0.281939 0.282033 0.282033 0.282043 0.280     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0058 0.282033 0.0100 0.07163 3.052 0.00134 0.281939 0.282033 0.282043 0.28     Mindedia is 1.31 1.45 7 1.40 1.4672 0.0058 0.282031 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.282033 0.19     Mindedia is 1.31 1.45 7 1.49 1.4672 0.0069 0.281959 0.0103 0.058417 2.848 0.001684 0.28193 0.282033 0.282034 0.18     Mindedia is 1.31 1.45 7 1.49 1.4672 0.0069 0.281959 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.282034 0.18     Mindedia is 1.31 1.45 7 1.45 1.4571 0.0069 0.282030 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.180     Mindedia is 1.31 1.455 7 1.45 1.4571 0.0069 0.282030 0.0103 0.058417 2.848 0.001684 0.281939 0.282033 0.180     Mindedia is 1.17 1.455 7 1.45 1.4571 0.0069 0.281959 0.0103 0.05218 1.5.14 0.00184 0.281959 0.282030 0.180     Mindedia is 1.55 0.001934 0.0118 0.281959 0.281959 0.180     Mindedia is 1.55 0.001934 0.0118 0.028193 0.281959 0.180     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189     Mindedia is 1.55 0.001934 0.28198 0.281959 0.281959 0.189 | MM3651         15         0.38         15         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5 <th< td=""><td>MM36531         15         0.96         15         14671         0.0051         0.00053         0.661         0.282073         0.282091         0.02         0.282093         0.03         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.00033         0.282053         0.00033         0.282053         0.282053         0.00033         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053        
0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.292&lt;</td><td>Mid 36         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1<td>MAIGE         1         Col         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         1<!--</td--><td>M3661         1         0         1         6         4         6         4         6         4         6         4         6         5         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td></td></td></th<> <td>M3661         15         0.54         14575         0.005         0.22303         0.00063         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.200043         0.23205         0.200043         0.23205         0.23205         0.200043         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205</td> <td>M3663         15         0         14673         0.0056         0.282091         0.282091         0.282091         0.282091         0.18         1.18           M13661         1-4         1         1         1         0.00033         0.00563         0.282080         0.282091         0.01         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td> <td>Modelies         is         0.066         is         0.466         0.4820         0.000643         6.66         0.282094         0.071         0.282094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.79304         0.782094         0.793         0.782094         0.793         0.782094         0.793         0.79304         0.782094         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.79304         0.793         0.79304         0.793         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.793044         1.793         1.793</td> <td>Maidedity         is         0.83         is         is</td> <td>MA3663         15         0.56         3.46         1.4673         0.00054         0.22347         0.00053         5.61         0.22309         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303</td> <td>Montioneries         Could montioneries         Councie         Councie</td> | MM36531         15         0.96         15         14671         0.0051         0.00053         0.661         0.282073         0.282091         0.02         0.282093         0.03         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.00033         0.282053         0.00033         0.282053         0.282053         0.00033         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053      
  0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.282053         0.292< | Mid 36         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <td>MAIGE         1         Col         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         1<!--</td--><td>M3661         1         0         1         6         4         6         4         6         4         6         4         6         5         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td></td> | MAIGE         1         Col         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         4         1         1 </td <td>M3661         1         0         1         6         4         6         4         6         4         6         4         6         5         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td> | M3661         1         0         1         6         4         6         4         6         4         6         4         6         5         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         6         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 | M3661         15         0.54         14575         0.005         0.22303         0.00063         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.22305         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.23205         0.200043         0.200043         0.23205         0.200043         0.23205         0.23205         0.200043         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205         0.23205 | M3663         15         0         14673         0.0056         0.282091         0.282091         0.282091         0.282091         0.18         1.18           M13661         1-4         1         1         1         0.00033         0.00563         0.282080         0.282091         0.01         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 | Modelies         is         0.066         is         0.466         0.4820         0.000643         6.66         0.282094         0.071         0.282094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.782094         0.79304         0.782094         0.793         0.782094         0.793         0.782094         0.793         0.79304         0.782094         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.793         0.79304         0.79304         0.793      
  0.79304         0.793         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.79304         0.793044         1.793         1.793 | Maidedity         is         0.83         is         is | MA3663         15         0.56         3.46         1.4673         0.00054         0.22347         0.00053         5.61         0.22309         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303         0.22303 | Montioneries         Could montioneries         Councie         Councie |

$TDM_{\mathrm{c}}$	2125		1860	1898	1953	1712	1934	1855	1868	1790	2016	1780	1819	1862		2250	2222	2124	2068	2118
2σ			1.46	1.32	1.89	1.50	1.39	1.34	1.30	1.51	1.72	1.36	1.57			1.85	1.51	1.37	1.42	1.83
εHf <sub>(int)</sub>	1.73	2.38	6.12	5.51	4.67	8.43	4.96	6.19	5.98	7.21	3.68	7.36	6.74	6.08	2.70	0.06	0.51	2.04	2.92	2.15
$^{176}$ Hf/ $^{177}$ Hf $_{ap}$			0.282029	0.282017	0.282031	0.282102	0.281983	0.282051	0.282029	0.282075	0.282012	0.282121	0.282058			0.281846			0.281924	
$^{176}$ Hf/ $^{177}$ Hf $_{int}$	0.281889	0.000067	0.282001	0.281983	0.281960	0.282066	0.281968	0.282003	0.281997	0.282031	0.281932	0.282035	0.282018	0.281999	0.000076	0.281827	0.281839	0.281882	0.281907	0.281885
1σ%			5.17	5.16	5.39	5.13	5.15	5.12	5.95	5.13	5.12	5.17	5.32			5.27	6.06	6.84	5.43	6.35
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.000679	0.000240	0.001017	0.001193	0.002521	0.001294	0.000541	0.001711	0.001148	0.001548	0.002834	0.003019	0.001413	0.001658	0.001590	0.000692	0.000848	0.001263	0.000605	0.001262
1σ%			10.47	10.47	10.54	10.47	10.50	10.47	10.97	10.47	10.47	10.47	10.53			10.55	10.50	10.85	10.50	10.59
<sup>176</sup> Yb/ <sup>177</sup> Hf	0.029044	0.011169	0.013189	0.011672	0.016629	0.013456	0.012665	0.011671	0.011438	0.013456	0.014857	0.011209	0.014006	0.013113	0.003301	0.017246	0.013735	0.011914	0.012927	0.016634
1σ%			0.0132	0.0117	0.0166	0.0135	0.0127	0.0117	0.0114	0.0135	0.0149	0.0112	0.0140			0.0173	0.0137	0.0119	0.0129	0.0166
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.281908	0.000067	0.282029	0.282017	0.282031	0.282102	0.281983	0.282051	0.282029	0.282075	0.282012	0.282121	0.282058	0.282047	0.000081	0.281846	0.281863	0.281918	0.281924	0.281921
1σ%			0.0239	0.0230	0.0387	0.0243	0.0353	0.0227	0.0212	0.0224	0.0364	0.0224	0.0347			0.0464	0.0342	0.0315	0.0320	0.0342
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46726	0.00005	1.46712	1.46723	1.46574	1.46720	1.46634	1.46731	1.46725	1.46736	1.46586	1.46720	1.46630	1.46681	0.00124	1.46576	1.46539	1.46615	1.46644	1.46622
Tot.Hf			7.25	7.52	6.72	6.65	6.58	8.49	7.95	7.72	6.52	7.84	6.98			5.70	5.62	6.11	6.95	7.33
1σ	∞		4	4	4	4	4	4	4	4	4	4	4	4		9	9	9	9	9
Age	1485		1504	1504	1504	1504	1504	1504	1504	1504	1504	1504	1504	1504		1509	1509	1509	1509	1509
Disc.			2.83	2.83	-0.70	0.40	-0.30	-2.90	-2.90	06.0	-0.03	-3.25	1.02			1.68			-0.09	
Zircon	n=9		10a	10b	11	13	16	20a	20b	24	4	∞	6	n=11		17	19	20	ŝ	34
Sample	Ro-102b		R0G525	ROG525	R0G525	ROG525	R0G525	R0G525		SA3-04	SA3-04	SA3-04	SA3-04	SA3-04						

$TDM_{c}$	2014	2141	2160	2070	2119	2129		1891	1808	1821	1819	1819	1942	1923	1816	1760	1910	1851		
2σ	1.42	1.39	1.21	1.37	1.17			1.54	1.82	1.31	1.36	0.84	3.64	1.21	1.62	2.02	1.95			
εHf <sub>(int)</sub>	3.76	1.77	1.49	2.89	2.12	1.97	2.22	5.81	7.10	6.89	6.92	6.93	5.00	5.31	6.97	7.85	5.51	6.43	1.89	
$^{176}\mathrm{Hf}/^{177}\mathrm{Hf}_{\mathrm{ap}}$								0.282049	0.282083	0.282047	0.282056	0.282055	0.282017	0.282028	0.282088	0.282098	0.282029			
$^{176}\mathrm{Hf}/^{177}\mathrm{Hf}_{\mathrm{int}}$	0.281931	0.281875	0.281867	0.281906	0.281885	0.281880	0.000062	0.281983	0.282019	0.282013	0.282014	0.282014	0.281960	0.281969	0.282015	0.282040	0.281974	0.282000	0.000053	
1σ%	5.16	5.23	6.21	5.17	5.18			26.65	26.62	26.62	26.64	1.40	2.75	2.35	26.65	16.44	16.23			
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.000718	0.001068	0.000616	0.000739	0.000520	0.000833	0.000543	0.002314	0.002229	0.001182	0.001471	0.001414	0.001985	0.002064	0.002534	0.001990	0.001886	0.001907	0.000859	
1σ%	10.49	10.54	10.99	10.47	10.52			13.47	12.69	15.35	18.31	2.46	9.93	5.80	12.46	17.15	17.19			
<sup>176</sup> Yb/ <sup>177</sup> Hf	0.012926	0.012411	0.010777	0.012410	0.010571	0.013155	0.004435	0.068023	0.065214	0.045174	0.057095	0.043543	0.062934	0.065413	0.078418	0.015829	0.015347	0.051699	0.043327	
1σ%	0.0129	0.0124	0.0108	0.0124	0.0106			0.0076	0.0107	0.0084	0.0081	0.0067	0.0343	0.0101	0.0079	0.0158	0.0153			
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.281951	0.281905	0.281884	0.281927	0.281899	0.281904	0.000064	0.282049	0.282083	0.282047	0.282056	0.282055	0.282017	0.282028	0.282088	0.282098	0.282029	0.282055	0.000055	
1σ%	0.0295	0.0347	0.0285	0.0305	0.0320			0.0037	0.0045	0.0067	0.0045	0.0042	0.0077	0.0041	0.0046	0.0246	0.0393			
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46660	1.46619	1.46669	1.46651	1.46623	1.46622	0.00079	1.46732	1.46735	1.46726	1.46732	1.46736	1.46756	1.46743	1.46729	1.46732	1.46635	1.46726	0.00066	
Tot.Hf	7.52	6.36	7.10	8.03	7.83			5.41	4.30	6.53	6.70	3.39	2.17	2.03	6.77	7.46	6.90			
1σ	9	9	9	9	9	9		9	9	9	9	9	9	9	9	9	9	9		
Age	1509	1509	1509	1509	1509	1509		1518	1518	1518	1518	1518	1518	1518	1518	1518	1518	1518		
Disc.								0.67	-1.67	-0.35	0.69	0.69	0.03	0.83	0.44	0.50	2.69			
Zircon	39	46	59	59	60	n=10		ŝ	4	Ŋ	9	9	11	15	18	2	∞	n=10		
Sample	SA3-04	SA3-04	SA3-04	SA3-04	SA3-04	SA3-04		SA3-60												

$TDM_{\mathrm{c}}$	2065	2070	2060	2115	2128	1942	2121	2041	2002	2033	2044		1825	1925	1902	1868	1830	1918	1880	1928	1834	1928
2σ	2.07	1.84	1.38	1.15	1.85	1.16	1.70	1.74	1.91	1.73			1.05	0.79	1.21	0.98	0.89	0.98	0.81	0.66	0.91	0.75
εHf <sub>(int)</sub>	2.82	2.74	2.89	2.03	1.83	4.75	1.94	3.19	3.81	3.33	3.15	2.22	6.58	5.02	5.38	5.91	6.50	5.14	5.72	4.98	6.44	4.98
$^{176}$ Hf/ $^{177}$ Hf $_{ap}$	0.281964	0.281950	0.281959	0.281942		0.281995	0.281927						0.282034	0.281995	0.282006	0.282010	0.282033	0.281983	0.282001	0.281984	0.282024	0.281983
$^{176}$ Hf/ $^{177}$ Hf $_{\rm int}$	0.281912	0.281910	0.281914	0.281890	0.281884	0.281967	0.281887	0.281923	0.281940	0.281926	0.281921	0.000062	0.282017	0.281974	0.281984	0.281999	0.282015	0.281977	0.281993	0.281972	0.282014	0.281972
1σ%	17.67	26.63	3.45	1.38	16.37	1.83	26.61	17.82	16.98	16.20			26.60	1.94	26.65	26.78	5.25	26.66	1.42	1.45	26.60	1.45
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.001811	0.001423	0.001580	0.001838	0.001635	0.001003	0.001412	0.001372	0.001250	0.001487	0.001459	0.000500	0.000596	0.000755	0.000797	0.000411	0.000626	0.000231	0.000273	0.000413	0.000378	0.000380
1σ%	19.55	6.30	8.11	1.68	17.11	15.18	12.60	18.46	17.47	17.08			12.41	3.27	13.57	18.23	10.19	13.74	3.93	1.51	12.45	1.39
<sup>176</sup> γb/ <sup>177</sup> Hf	0.016333	0.041200	0.081137	0.057270	0.014657	0.036351	0.040480	0.013808	0.015832	0.013808	0.033699	0.043485	0.020015	0.028851	0.028754	0.015687	0.023742	0.008547	0.011828	0.019446	0.013096	0.013688
1σ%	0.0163	0600.0	0.0076	0.0056	0.0147	0.0056	0.0076	0.0138	0.0158	0.0138			0.0074	0.0061	0.0084	0.0071	0.0070	0.0076	0.0064	0.0050	0.0065	0.0059
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.281964	0.281950	0.281959	0.281942	0.281931	0.281995	0.281927	0.281962	0.281976	0.281969	0.281963	0.000053	0.282034	0.281995	0.282006	0.282010	0.282033	0.281983	0.282001	0.281984	0.282024	0.281983
1σ%	0.0317	0.0067	0.0036	0.0032	0.0203	0.0028	0.0048	0.0184	0.0258	0.0208			0.0037	0.0046	0.0056	0.0036	0.0044	0.0035	0.0033	0.0040	0.0038	0.0038
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46702	1.46724	1.46717	1.46730	1.46729	1.46734	1.46732	1.46720	1.46677	1.46706	1.46718	0.00035	1.46733	1.46727	1.46730	1.46732	1.46730	1.46727	1.46727	1.46720	1.46733	1.46722
Tot.Hf	8.59	3.68	7.57	5.51	6.40	8.22	5.39	6.41	8.37	8.32			7.63	5.99	6.87	7.03	5.97	6.93	5.72	6.70	7.00	6.10
1σ	22	22	22	22	22	22	22	22	22	22	22		2	2	2	2	2	2	2	2	2	2
Age	1497	1497	1497	1497	1497	1497	1497	1497	1497	1497	1497		1498	1498	1498	1498	1498	1498	1498	1498	1498	1498
Disc.	10.57	0.42	17.34	1.90		9.78	0.02						0.47	0.47	0.45	0.46	0.46	0.88	0.88	0.87	0.79	0.79
Zircon	Ч	14	17	19	2	21	23	4	ß	9	n=11		1a	$^{1b}$	4	ба	6b	10a	10b	14	15a	15b
Sample	SA7-04		SA7-86																			

$TDM_{\mathrm{c}}$	1821	1825	1992	1850	1894	1941	1901	1905	1907	1971	1885	1892		1829	1951	1844	1877	1825	1887	1970	1762	1857
2σ	1.04	0.84	1.60	1.96	1.44	1.47	1.51	1.76	1.54	1.72	1.56			1.70	1.97	1.68	1.62	1.38	1.77	1.76	1.31	1.71
εHf <sub>(int)</sub>	6.65	6.58	3.97	6.19	5.51	4.78	5.40	5.33	5.30	4.30	5.65	5.54	1.52	6.59	4.68	6.35	5.84	6.64	5.69	4.38	7.62	6.14
$^{176}$ Hf/ $^{177}$ Hf $_{ap}$	0.282027	0.282033	0.281955	0.282026	0.282000	0.281981	0.282004	0.282026	0.282000	0.281974	0.282011			0.282084	0.282026			0.282068			0.282097	
$^{176}$ Hf/ $^{177}$ Hf $_{\rm int}$	0.282019	0.282017	0.281944	0.282006	0.281987	0.281967	0.281984	0.281982	0.281982	0.281953	0.281991	0.281988	0.000043	0.282014	0.281961	0.282008	0.281993	0.282016	0.281989	0.281952	0.282044	0.282002
1σ%	1.37	1.74	16.18	19.97	16.21	16.19	16.25	16.18	16.63	16.79	20.69			6.01	6.23	5.92	5.97	6.29	7.00	5.51	5.17	6.19
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.000271	0.000551	0.000377	0.000675	0.000435	0.000490	0.000679	0.001527	0.000636	0.000716	0.000681	0.000567	0.000555	0.002461	0.002312	0.002097	0.002602	0.001845	0.002194	0.001588	0.001895	0.002940
1σ%	2.13	3.11	17.01	22.12	17.09	17.04	17.17	17.02	17.35	18.79	21.42			10.50	10.49	10.62	11.01	11.00	10.58	10.54	10.56	10.64
$^{176}$ Yb $/^{177}$ Hf	0.011700	0.021839	0.014221	0.017109	0.012573	0.012727	0.012889	0.014011	0.013236	0.014882	0.013059	0.016281	0.011059	0.014854	0.017545	0.014855	0.014006	0.011911	0.015437	0.016030	0.011437	0.014568
1σ%	0.0088	0.0067	0.0142	0.0171	0.0126	0.0127	0.0129	0.0140	0.0132	0.0149	0.0131			0.0149	0.0176	0.0149	0.0140	0.0119	0.0154	0.0160	0.0114	0.0146
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.282027	0.282033	0.281955	0.282026	0.282000	0.281981	0.282004	0.282026	0.282000	0.281974	0.282011	0.282004	0.000044	0.282084	0.282026	0.282067	0.282067	0.282068	0.282051	0.281997	0.282097	0.282085
1σ%	0.0071	0.0051	0.0163	0.0530	0.0179	0.0179	0.0179	0.0167	0.0184	0.0224	0.0184			0.0310	0.0410	0.0280	0.0310	0.0224	0.0305	0.0336	0.0263	0.0267
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46723	1.46730	1.46692	1.46516	1.46656	1.46671	1.46682	1.46685	1.46703	1.46669	1.46715	1.46701	0.00098	1.46627	1.46604	1.46660	1.46653	1.46699	1.46623	1.46634	1.46702	1.46700
Tot.Hf	6.93	6.36	8.80	6.64	8.88	8.22	7.11	6.72	7.98	8.86	7.55			7.15	5.53	6.19	6.74	7.26	6.75	6.64	6.73	6.78
1σ	2	2	2	2	2	2	2	2	2	2	2	2		1	-	-	Ч	Ч	Ļ	-	Ļ	1
Age	1498	1498	1498	1498	1498	1498	1498	1498	1498	1498	1498	1498		1503	1503	1503	1503	1503	1503	1503	1503	1503
Disc.	1.16	2.30	4.46	1.10	3.21	2.60	3.10	2.51	2.21	1.75	0.66			1.00	0.89			1.50			0.97	
Zircon	17	18	22	23	27	29	31	36b	40	44	٢	n=21		12	17	20	27	31	32	33	4	ъ
Sample	SA7-86		SA7-91																			

$TDM_{c}$	1868	1867		1834	1794	1828	1855	1921	1939	1917	1787	1910	1960	1797	1890	1882	1986	1879		
2σ	1.59			1.31	1.27	1.68	0.93	1.57	1.13	1.49	0.88	1.40	0.96	1.30	1.33	2.16	2.60			
$\epsilon H f_{(\rm int)}$	5.97	5.99	1.89	6.60	7.22	6.70	6.28	5.25	4.96	5.31	7.34	5.42	4.64	7.18	5.73	5.86	4.24	5.91	2.00	
$^{176}\mathrm{Hf}/^{177}\mathrm{Hf}_{\mathrm{ap}}$	0.282078			0.282046	0.282086	0.282074	0.282062	0.282027	0.282028	0.282029	0.282077	0.282030	0.282023	0.282069	0.282055	0.282032				
$^{176}\mathrm{Hf}/^{177}\mathrm{Hf}_{\mathrm{int}}$	0.281997	0.281998	0.000053	0.282010	0.282027	0.282012	0.282001	0.281972	0.281964	0.281973	0.282030	0.281976	0.281954	0.282026	0.281985	0.281989	0.281943	0.281990	0.000056	
1σ%	5.28			26.61	2.05	26.73	2.60	26.83	1.44	26.73	2.00	27.11	2.13	26.64	1.80	17.08	16.29			
$^{176}$ Lu/ $^{177}$ Hf	0.002860	0.002279	0.000886	0.001286	0.002055	0.002165	0.002146	0.001949	0.002255	0.001961	0.001630	0.001890	0.002402	0.001516	0.002445	0.001497	0.002151	0.001953	0.000706	
1σ%	10.56			14.75	5.70	21.01	4.98	14.00	2.02	15.08	5.47	20.92	6.04	12.71	4.63	17.94	17.30			
$^{176}$ Yb/ $^{177}$ Hf	0.013729	0.014437	0.003629	0.048610	0.062953	0.076596	0.070532	0.059622	0.070125	0.083568	0.063855	0.077117	0.074564	0.062910	0.076295	0.017917	0.021374	0.061860	0.039967	
1σ%	0.0137			0.0081	0.0107	0.0095	0.0073	0.0089	0.0094	0.0081	0.0070	0.0074	0.0076	0.0074	0.0114	0.0179	0.0214			
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.282078	0.282062	0.000060	0.282046	0.282086	0.282074	0.282062	0.282027	0.282028	0.282029	0.282077	0.282030	0.282023	0.282069	0.282055	0.282032	0.282005	0.282046	0.000049	
1σ%	0.0227			0.0046	0.0055	0.0055	0.0027	0.0050	0.0042	0.0049	0.0058	0.0039	0.0041	0.0049	0.0049	0.0293	0.0497			
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46713	1.46662	0.00079	1.46725	1.46747	1.46714	1.46726	1.46741	1.46729	1.46732	1.46733	1.46728	1.46733	1.46729	1.46758	1.46713	1.46636	1.46725	0.00056	
Tot.Hf	6.69			6.47	4.32	6.31	5.82	5.15	2.19	5.73	6.65	6.21	5.13	5.71	3.46	8.37	7.17			
1σ	1	Ч		ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ	ŝ		
Age	1503	1503		1511	1511	1511	1511	1511	1511	1511	1511	1511	1511	1511	1511	1511	1511	1511		
Disc.	1.69			-0.32	-0.32	0.09	0.09	-0.29	-0.29	-0.57	-0.57	0.02	0.02	0.44	0.44	0.23				
Zircon	6	n=10		Ч	1 rep	ß	5 rep	7	7 rep	6	9 rep	11	11 rep	16	16 rep	17	∞	n=14		
Sample	SA7-91	SA7-91		SA7-130																

$TDM_{\mathrm{c}}$	1796	1713	1441	1772	1539	1581	1466	1711	1553	1604	1757	1663	1758			1715	1677	1701	1730
2σ	1.43	1.39	1.72	1.56	1.34	1.45	1.71	1.56	1.66	1.96	1.98	1.72	1.74			1.06	1.20	1.04	1.14
$\epsilon H f_{(int)}$	7,11	8.34	12.74	7.51	11.34	10.41	12.00	8.37	10.47	9.45	1.50	2.99	1.49	1.99	1.73	2.46	3.07	2.69	2.22
<sup>176</sup> Hf/ <sup>177</sup> Hfap	0.282062	0.282101	0.282217	0.282087	0.282178	0.282160	0.282212	0.282096	0.282169	0.282160	0.282199	0.282241	0.282200			0.282207	0.282222	0.282212	0.282199
<sup>176</sup> Hf/ <sup>177</sup> Hfint	0.282022	0.282061	0.282183	0.282032	0.282135	0.282122	0.282179	0.282062	0.282143	0.282125	0.282181	0.28223	0.282181	0.282195	0.000049	0.282194	0.282211	0.282200	0.282187
1σ%	26.67	26.60	26.91	26.75	26.72	26.67	26.75	26.60	26.84	26.81	26.89	26.65	27.43			27.28	26.62	26.92	27.13
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.001389	0.001379	0.001170	0.001893	0.001467	0.001314	0.001186	0.001194	0.000940	0.001278	0.000935	0.000931	0.001010	0.000958	0.000089	0.000700	0.000583	0.000626	0.000632
1ơ%	20,20	17.27	34.16	21.73	19.29	24.92	21.38	13.06	29.64	28.07	12.74	13.53	19.94			30.36	15.17	20.92	24.00
<sup>176</sup> Yb/ <sup>177</sup> Hf	0.048047	0.060109	0.046549	0.089757	0.057283	0.051749	0.035494	0.048784	0.031907	0.034903	0.031289	0.025088	0.031902	0.029426	0.007539	0.025593	0.020370	0.019526	0.022827
1σ%	0.0080	0.0089	0.0113	0.0078	0.0077	0.0094	0.0116	0.0098	0.0118	0.0113	0.0113	0.0087	0.0087			0.0086	0.0103	0.0086	0.0096
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.282062	0.282101	0.282217	0.282087	0.282178	0.282160	0.282212	0.282096	0.282169	0.282160	0.282199	0.282241	0.282200	0.282214	0.000048	0.282207	0.282222	0.282212	0.282199
1σ%	0.0036	0.0059	0.0038	0.0034	0.0046	0.0044	0.0052	0.0050	0.0066	0.0066	0.0056	0.0052	0.0039			0.0043	0.0058	0.0041	0.0045
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46726	1.46719	1.46723	1.46722	1.46734	1.46723	1.46741	1.46728	1.46748	1.46747	1.46731	1.46752	1.46732	1.46738	0.00024	1.46725	1.46726	1.46729	1.46733
Tot.Hf	8.96	11.13	9.71	8.14	10.86	10.22	7.30	6.50	5.44	5.54	7.36	8.06	8.84			7.67	7.62	6.67	6.83
1α	5	9	12	12	ø	7	1	12	10	23	31	31	31	31		ი	с	с	ო
Age	1514	1507	1510	1515	1523	1503	1484	1507	1473	1457	1020	1020	1020	1020		1043	1043	1043	1043
Disc.	1.63	-0.45	0.71	-0.54	0.13	-0.31	-1.11	-0.58	-6.36	-2.35	10.69	15.96	6.07			0.32	-2.38	-1.88	-0.90
Zircon	œ	1	14	16	20	25	5	10	14	20	7	8	1	n=3		13.9	13.5	14.9	14.15
Sample	MM26297	MM26297	MM26297	MM26297	MM26297	MM26297	MM2230		MM2247	MM2247	MM2247	MM2247							

Sample	Zircon	Disc.	Age	1α	Tot.Hf <sup>1</sup>	<sup>78</sup> Hf/ <sup>177</sup> Hf	10%	<sup>176</sup> Hf/ <sup>177</sup> Hf	1 <del>0</del> %	<sup>176</sup> Υb/ <sup>177</sup> Hf	1ơ%	<sup>176</sup> Lu/ <sup>177</sup> Hf	1 <del>0</del> %	<sup>176</sup> Hf/ <sup>177</sup> Hfint	<sup>176</sup> Hf/ <sup>177</sup> Hfap	εHf <sub>(int)</sub>	2σ	$TDM_{c}$
MM2247	13.13	-0.88	1043	с	6.70	1.46729	0.0040	0.282225	0.0086	0.021568	13.72	0.000589	26.65	0.282214	0.282225	3.17	1.03	1670
MM2247	13.18	-3.06	1043	ю	5.51	1.46723	0.0045	0.282194	0.0089	0.040441	18.36	0.000996	26.89	0.282175	0.282194	1.79	1.15	1757
MM2247	n=6		1043	ю		1.46728		0.282210		0.025054		0.000688		0.282197		2.57		
						0.00007		0.000025		0.015663		0.000314		0.000030		1.05		
MM2277	21	5.09	991	18	11.96	1.46720	0.0047	0.282185	0.0074	0.051693	18.30	0.001446	26.62	0.282158	0.282185	0.00	1.38	1828
MM2277	27	3.62	991	18	10.58	1.46720	0.0039	0.282187	0.0072	0.047326	22.66	0.001264	26.63	0.282163	0.282187	0.19	1.33	1816
MM2277	29	-1.57	991	18	10.35	1.46729	0.0048	0.282180	0.0077	0.030262	30.44	0.000862	26.94	0.282164	0.282180	0.21	1.31	1815
MM2277	n=3		991	18		1.46723		0.282184		0.043094		0.001191		0.282161		0.14		
						0.00010		0.000007		0.022650		0.000598		0.000007		0.23		
MM26226	12	-5.89	993	8	7.21	1.46727	0.0040	0.282168	0.0087	0.038383	17.38	0.001142	26.79	0.282147	0.282168	-0.33	1.25	1850
MM26226	18	-3.75	993	8	6.42	1.46749	0.0053	0.282224	0.0096	0.026329	15.56	0.000841	26.85	0.282209	0.282224	1.86	1.28	1713
MM26226	21	-4.12	993	8	7.85	1.46729	0.0053	0.282178	0.0105	0.037869	19.05	0.000874	26.69	0.282162	0.282178	0.20	1.38	1817
MM26226	23	-0.55	993	8	6.53	1.46749	0.0055	0.282235	0.0179	0.043632	14.46	0.001225	26.72	0.282212	0.282235	1.99	2.18	1705
MM26226	n=4		993	8		1.46739		0.282202		0.036553		0.001021		0.282183		0.93		
						0.00024		0.000066		0.014593		0.000383		0.000066		2.34		
MM26302	13		1022	ю	11.60	1.46727	0.0236	0.282168	0.0106	0.010568	10.47	0.000615	5.14	0.282157		0.67	1.15	1810
MM26302	17		1022	ю	8.87	1.46736	0.0219	0.282173	0.0114	0.011435	11.20	0.000799	6.73	0.282158		0.72	1.25	1807
MM26302	18	-2.24	1022	ო	10.56	1.46730	0.0230	0.282173	0.0119	0.011909	15.95	0.001068	12.97	0.282153	0.282173	0.54	1.35	1819

$TDM_{\mathrm{c}}$	1908	1860	1887			1770	1738	1860	1874	1869	1919	1868	1564	1639			1851	1863	1794	1816
2σ	1.25	1.33	1.35			1.11	1.11	1.25	1.31	1.10	1.30	1.13	1.10	1.18			1.74	1.39	1.48	1.37
εHf <sub>(int)</sub>	-0.89	-0.12	-0.56	0.06	1.38	1.61	2.13	0.18	-0.06	0.04	-0.78	0.04	4.90	3.71	1.31	3.88	0.08	-0.10	1.00	0.65
<sup>176</sup> Hf/ <sup>177</sup> Hfap						0.282179	0.282198	0.282163	0.282138	0.282134	0.282112	0.282143	0.282277	0.282246			0.282180		0.282198	0.282179
<sup>176</sup> Hf/ <sup>177</sup> Hfint	0.282113	0.282134	0.282122	0.282139	0.000039	0.282168	0.282183	0.282127	0.282121	0.282123	0.282101	0.282124	0.282261	0.282227	0.282159	0.000110	0.282137	0.282132	0.282163	0.282153
1 <del>0</del> %	11.17	7.14	5.13			26.61	26.63	27.00	26.62	26.61	26.60	26.67	5.12	5.24			27.27	27.18	26.69	27.00
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.000829	0.001103	0.000553	0.000828	0.000452	0.000588	0.000805	0.001828	0.000890	0.000554	0.000601	0.001007	0.000851	0.000979	0.0000.0	0.000773	0.002208	0.001915	0.001806	0.001333
1 <del>0</del> %	13.87	11.26	10.47			12.39	12.84	15.38	13.79	14.29	12.68	14.53	10.47	10.51			20.12	28.24	21.76	17.81
<sup>176</sup> Yb/ <sup>177</sup> Hf	0.011209	0.012154	0.012661	0.011656	0.001485	0.023546	0.033346	0.069571	0.035643	0.022147	0.024052	0.041563	0.009999	0.010773	0.030071	0.036407	0.079585	0.082118	0.063283	0.055389
1σ%	0.0112	0.0122	0.0127			0.0093	0.0089	0.0084	0.0108	0.0093	0.0112	0.0087	0.0100	0.0108			0.0108	0.0078	0.0089	0.0087
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.282128	0.282155	0.282132	0.282155	0.000041	0.282179	0.282198	0.282163	0.282138	0.282134	0.282112	0.282143	0.282277	0.282246	0.282177	0.000110	0.282180	0.282169	0.282198	0.282179
1 <del>0</del> %	0.0300	0.0336	0.0258			0.0038	0.0038	0.0041	0.0066	0.0045	0.0049	0:0050	0.0236	0.0239			0.0048	0.0033	0.0051	0.0047
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46691	1.46707	1.46705	1.46716	0.00035	1.46728	1.46728	1.46726	1.46723	1.46720	1.46718	1.46722	1.46702	1.46701	1.46719	0.00021	1.46739	1.46713	1.46730	1.46722
Tot.Hf	12.48	10.20	8.80			6.07	5.59	7.58	7.06	5.64	5.44	5.83	10.76	10.01			9.68	10.70	9.10	9.15
1σ	ю	С	ю	С		с	с	З	З	З	З	С	С	С	З		12	12	12	12
Age	1022	1022	1022	1022		1046	1046	1046	1046	1046	1046	1046	1046	1046	1046		1027	1027	1027	1027
Disc.						-2.09	-9.34	-1.43	-0.87	-2.78	-5.49	0.20	1.47	-1.75			1.86		8.16	6.43
Zircon	9	25	27	n=6		ю	9	ŋ	12	14	15	17	23	26	0=u		4	თ	17	23
Sample	MM26302	MM26302	MM26302	MM26302		MM26306		ROG218	ROG218	ROG218	ROG218									

0.20 1.18 1843	0.37	0.37 <i>0.90</i> 0.07 1.41 1833	0.37 0.90 0.07 1.41 1833 -0.42 1.35 1864	0.37 0.90 0.07 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993	0.37 0.90 0.07 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949	0.37 0.90 0.07 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949	0.37 0.90 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949 -0.78 -0.78	0.37 0.90 0.07 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949 -0.78 -0.78 2.67	0.37 0.90 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949 -0.780.78 2.67	0.37 0.90 1.41 1833 0.07 1.41 1834 0.74 1.47 1791 0.74 1.47 1993 1.52 1993 1.52 1993 1.52 1993 1.67 1949 1.46 1949 2.67 2.67 1.03 1.81 1711	0.37 0.90 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949 -0.78 1.46 1949 -0.78 1.46 1949 -0.78 1.46 1791 1.03 1.81 1711 -0.36 1.46 1798	0.37	0.37 0.90 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949 -0.78 1.91 1711 1.03 1.81 1714 1.03 1.81 1764 0.19 1.18 1764 0.19 1.18 1764	0.37 0.90 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949 -1.78 1.949 -1.63 1.81 1711 1.03 1.81 1711 -0.36 1.46 1798 0.19 1.18 1764 0.06 1.56 1815	0.37	0.37 0.90 0.07 1.41 1833 -0.42 1.35 1864 0.74 1.47 1791 -2.50 1.52 1993 -1.79 1.46 1949 -1.78 1.46 1798 0.19 1.18 1764 0.19 1.18 1764 0.19 1.18 1764 0.19 1.18 1764 0.06 1.46 1315 0.06
0.282157 (	C	0.282170 (	0.282170 (0.282153 -1.0.0.282163 -1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0	0.282170 ( 0.282153	0.282170 0.282153 0.282153 0.282189 0.282103 0.282118 0.282118	0.282170 0.282153 0.282153 0.282189 0.282103 0.282118 0.282118	0.282170 ( 0.282153 0.282189 ( 0.282103 0.282118 -	0.282170 (0.282153 - 0.282189 (0.282103 - 0.282103 - 0.282103 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282118 - 0.282182 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.28218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 - 0.288218 -	0.282170 0.282153 0.282163 0.282189 0.282103 0.282103 0.282118 0.282216 0.282266	0.282170 0.282153 0.282189 0.282189 0.282103 0.282103 0.282103 0.282199 0.282199	0.282170 0.282153 0.282189 0.282189 0.282103 0.282103 0.282103 0.282103 0.282103 0.282109 0.282199 0.282199	0.282170 0.282153 0.282153 0.282189 0.282103 0.282103 0.282103 0.282199 0.282199 0.282199 0.282199	0.282170 0.282153 0.282189 0.282189 0.282103 0.282103 0.282199 0.282199 0.282199 0.282199 0.282198 0.282198 1	0.282170 0.282153 0.282189 0.282103 0.282103 0.282103 0.282103 0.282199 0.282199 0.282199 0.282199 0.282199 1	0.282170 0.282153 0.282189 0.282189 0.282103 0.282103 0.282199 0.282199 0.282199 0.282199 0.282198 0.282198	0.282153 - 0.282153 - 0.282153 - 0.282169 - 0.282103 - 0.282103 - 0.282103 - 0.282103 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0.282109 - 0
0.282140	0.282145	0.282145 <i>0.000025</i> 0.282152	0.282145 0.000025 0.282152 0.282138	0.282145 0.000025 0.282152 0.282138 0.282171 0.282079	0.282145 0.000025 0.282152 0.282138 0.282138 0.282079 0.282099	0.282145 0.00025 0.282152 0.282138 0.282138 0.282079 0.282099 0.282128	0.282145 0.000025 0.282152 0.282138 0.282138 0.282039 0.282039 0.282128 0.282128	0.282145 0.000025 0.282152 0.282138 0.282138 0.282138 0.282099 0.282128 0.282128 0.282128	0.282145 0.00025 0.282152 0.282171 0.282171 0.282099 0.282099 0.2822099 0.2822099 0.2822099	0.282145 0.00025 0.282152 0.282171 0.282171 0.282128 0.282299 0.282128 0.282299 0.282299 0.282299	0.282145 0.00025 0.282152 0.282138 0.282171 0.282099 0.282099 0.2822099 0.282128 0.282209 0.282209 0.282209	0.282145 0.00025 0.282152 0.282171 0.282171 0.282099 0.282099 0.282128 0.282128 0.282229 0.282229 0.282229 0.2822190 0.282229	0.282145 0.00025 0.282152 0.282171 0.282171 0.282128 0.282299 0.282128 0.282299 0.282190 0.282296 0.282296 0.282296	0.282145 0.00025 0.282152 0.282171 0.282171 0.282099 0.282099 0.282128 0.282128 0.282190 0.282296 0.282296 0.282296 0.2822190 0.282206	0.282145 0.000025 0.282152 0.282171 0.282171 0.282099 0.282128 0.282128 0.282128 0.282190 0.282299 0.282190 0.282206 0.282190 0.282206 0.282206	0.282145 0.000025 0.282152 0.282152 0.282171 0.282138 0.282171 0.282138 0.282299 0.282299 0.282299 0.282299 0.282299 0.282296 0.282296 0.282296 0.282296 0.282296 0.282296 0.282296 0.282296 0.282296
26.66		26.81	26.81 26.71	26.81 26.65 26.65 26.69	26.81 26.71 26.65 26.65 26.65	26.81 26.65 26.65 26.69 26.69	26.81 26.65 26.65 26.69 26.75	26.81 26.65 26.65 26.69 26.75	26.81 26.65 26.69 26.69 26.75 6.35	26.81 26.71 26.65 26.69 26.75 6.35 6.00	26.81 26.71 26.65 26.69 6.35 6.35 6.00	26.81 26.65 26.65 26.69 26.69 6.35 6.35 6.35 6.21 12.38	26.81 26.71 26.65 26.69 6.35 6.00 6.21 12.38	26.81 26.65 26.65 6.35 6.35 6.00 6.21 12.38	26.81 26.71 26.65 26.69 6.00 6.00 6.21 12.38	26.81 26.75 26.65 6.35 6.35 6.21 12.38 6.21 7.55
0.000849	0.001622	0.001622 0.001070 0.000934	0.001622 0.001070 0.000334 0.000779	0.001622 0.001070 0.000334 0.000779 0.000348 0.001226	0.001622 0.001070 0.000334 0.000779 0.000348 0.001226 0.000365	0.001622 0.001070 0.000334 0.000348 0.000348 0.001226 0.000365 0.000365	0.001622 0.0010779 0.000348 0.000348 0.000348 0.000365 0.000322	0.001622 0.0010779 0.000348 0.000348 0.000348 0.000365 0.000370 0.000322	0.001622 0.0010779 0.000348 0.000348 0.000348 0.001226 0.000365 0.000365 0.000370 0.000372	0.001622 0.0010779 0.000348 0.000348 0.000348 0.001226 0.000365 0.000370 0.000325 0.000535	0.001622 0.0010779 0.000344 0.000348 0.000348 0.000365 0.000365 0.000352 0.000535 0.000535	0.001622 0.0010779 0.000348 0.000348 0.000348 0.000365 0.000365 0.000365 0.0003635 0.000535 0.000535 0.000508	0.001622 0.0010779 0.000348 0.000348 0.000348 0.000370 0.000322 0.000325 0.000535 0.000535 0.000508	0.001622 0.0010779 0.000344 0.000348 0.0001226 0.000365 0.000365 0.000365 0.000335 0.000335 0.000535 0.000508	0.001622 0.0010779 0.000348 0.000348 0.000348 0.000370 0.000322 0.000325 0.000535 0.000535 0.000535 0.000535 0.000535 0.000535	0.001622 0.0010770 0.000344 0.000348 0.000348 0.000365 0.000365 0.000322 0.000365 0.000365 0.000365 0.000365 0.000365 0.000365 0.000365 0.000365 0.000365 0.000365 0.000365 0.000476
7 16.88	0	7 7 1 16.76	) 7 1 16.76 5 27.26 48.08	) 7 1 16.76 5 27.26 2 18.08 8 18.93	) 7 1 16.76 5 27.26 2 18.08 8 18.93 0 16.77	) 1 16.76 3 27.26 2 18.08 8 18.93 0 16.77	) 1 16.76 5 27.26 2 18.08 3 18.93 0 16.77 2	) 1 16.76 5 27.26 5 27.26 3 18.03 3 18.93 5 16.77	) 1 16.76 3 27.26 2 18.08 3 18.93 16.77 9 10.73	) 1 16.76 3 27.26 2 18.08 3 18.93 3 18.93 9 10.73 6 10.64	) 1 16.76 3 27.26 2 18.08 3 18.93 3 18.93 1 6.77 9 10.73 6 10.64 9 11.17	) 1 16.76 5 27.26 5 27.26 2 18.08 3 18.93 3 18.93 3 16.77 9 10.73 9 10.73 9 10.64 9 11.17 2 15.15	) 1 16.76 5 27.26 5 27.26 2 18.08 3 18.93 3 18.93 3 16.77 9 10.73 9 11.17 2 15.15 2 15.15	) 1 16.76 5 27.26 5 27.26 2 18.08 3 18.93 3 18.93 3 16.77 9 10.73 9 10.73 9 11.17 2 15.15 9 15.15	) 1 16.76 3 27.26 2 18.08 3 18.93 3 18.93 3 18.93 3 10.73 9 10.73 9 10.73 9 11.17 2 15.15 9	) 1 16.76 3 27.26 2 18.08 3 18.93 3 18.93 3 18.93 3 18.93 3 18.93 3 18.93 3 18.93 3 18.13 5 10.64 9 11.17 9 11.17 2 15.15 9 11.17 9 11.17 9 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17 11.17
0.037877	0.063650	0.063650 <i>0.036437</i> 0.037231	0.063650 0.036437 0.037231 0.037231 0.028726	0.063650 0.036437 0.037231 0.028726 0.028726 0.042382 0.056118	0.063650 0.036437 0.037231 0.028726 0.028726 0.028382 0.028118 0.056118	0.063650 0.036437 0.037231 0.028726 0.028726 0.0287280 0.024580 0.039808	0.063650 0.036437 0.037231 0.028726 0.028726 0.028726 0.0238280 0.039808 0.039808	0.063650 0.037231 0.028726 0.028726 0.028726 0.028726 0.0287280 0.039808 0.039808 0.020722	0.063650 0.036437 0.037231 0.028726 0.028726 0.028726 0.039808 0.039808 0.039808 0.039808	0.063650 0.037231 0.037231 0.028726 0.028726 0.042382 0.042382 0.042382 0.042382 0.0423808 0.039808 0.039808 0.039808 0.016619 0.013726	0.063650 0.037231 0.037231 0.028726 0.028726 0.042382 0.042382 0.042382 0.042382 0.042382 0.039808 0.039808 0.039808 0.039808 0.039808 0.033808 0.033808 0.033808 0.033808 0.033808 0.033808 0.033808 0.033808 0.033808 0.033808 0.033808 0.033723 0.033808 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033723 0.033722 0.033722 0.033723 0.033722 0.033722 0.033723 0.033723 0.033722 0.033723 0.00037222 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0003722 0.0000000000000000000000000000000000	0.063650 0.037231 0.037231 0.028726 0.028726 0.042382 0.042382 0.042382 0.039808 0.039808 0.039808 0.039808 0.039808 0.013726 0.010362 0.0114282	0.063650 0.037231 0.037231 0.028726 0.042382 0.042382 0.042382 0.042382 0.042382 0.042382 0.039808 0.039808 0.039808 0.016619 0.013726 0.013726 0.013726	0.063650 0.037231 0.037231 0.028726 0.028726 0.042382 0.042382 0.039808 0.039808 0.039808 0.039808 0.039808 0.039808 0.039808 0.0336908 0.013726 0.013726 0.013749 0.013749	0.063650 0.037231 0.037231 0.028726 0.028726 0.042382 0.042382 0.039808 0.034580 0.034580 0.034580 0.034580 0.034580 0.034580 0.013726 0.013726 0.013726 0.013726 0.013726	0.063650 0.037231 0.037231 0.028726 0.028726 0.042382 0.0423828 0.039808 0.039808 0.039808 0.034580 0.034580 0.013726 0.013726 0.013726 0.013749 0.013749 0.013749
0.0077		0.0078	0.0078 0.0075	0.0078 0.0075 0.0085 0.0085	0.0078 0.0075 0.0085 0.0085	0.0078 0.0075 0.0085 0.0085	0.0078 0.0075 0.0085 0.0085	0.0078 0.0085 0.0085 0.0082	0.0078 0.0075 0.0085 0.0085 0.0082	0.0078 0.0075 0.0085 0.0082 0.0082 0.0166	0.0078 0.0075 0.0085 0.0082 0.0082 0.0166 0.0137 0.0104	0.0078 0.0085 0.0085 0.0082 0.0082 0.0137 0.0137 0.0143	0.0078 0.0085 0.0085 0.0082 0.0166 0.0137 0.0137 0.0143	0.0078 0.0085 0.0085 0.0082 0.0166 0.0137 0.0137 0.0143	0.0078 0.0085 0.0085 0.0082 0.0166 0.0137 0.0104 0.0143	0.0078 0.0085 0.0085 0.0082 0.0166 0.0137 0.0104 0.0143
0.282157 0.282176		0.000030	0.000030 0.282170 0.282153	0.000030 0.282170 0.282153 0.282189 0.282103	0.000030 0.282170 0.282153 0.282189 0.282103 0.282103	0.000030 0.282170 0.282153 0.282189 0.282103 0.282103 0.282103 0.282146	0.000030 0.282153 0.282153 0.282189 0.282103 0.282103 0.282103 0.282146 0.282146	0.000030 0.282153 0.282153 0.282189 0.282103 0.282103 0.282146 0.282146 0.282146	0.000030 0.282170 0.282153 0.282189 0.282103 0.282103 0.282103 0.282146 0.282146 0.2822166	0.000030 0.282153 0.282153 0.282189 0.282189 0.282103 0.282103 0.282146 0.282146 0.00071 0.282199	0.000030 0.282170 0.282153 0.282189 0.282103 0.282103 0.282146 0.282146 0.282266 0.282199 0.282241	0.000030 0.282170 0.282153 0.282189 0.282103 0.282103 0.282146 0.282146 0.282146 0.282266 0.282266 0.282261	0.000030 0.282153 0.282153 0.282189 0.282103 0.282103 0.282146 0.00071 0.282199 0.282266 0.282296	0.000030 0.282170 0.282153 0.282189 0.282103 0.282103 0.282146 0.282146 0.282266 0.282241 0.282266 0.282241 0.2822266	0.000030 0.282153 0.282153 0.282189 0.282103 0.282103 0.282103 0.282146 0.282146 0.282241 0.282266 0.2822199 0.2822198 0.282226	0.000030 0.282170 0.282153 0.282189 0.282103 0.282199 0.282199 0.282199 0.282199 0.282199 0.282296 0.282298 0.282298 0.282298
0.0045		0.0044	0.0044 0.0042	0.0044 0.0042 0.0051 0.0036	0.0044 0.0042 0.0051 0.0036 0.0036	0.0044 0.0042 0.0051 0.0036 0.0036	0.0044 0.0042 0.0051 0.0036 0.0042	0.0044 0.0042 0.0051 0.0036 0.0042	0.0044 0.0042 0.0051 0.0036 0.0042 0.0042	0.0044 0.0042 0.0051 0.0036 0.0042 0.0042 0.0280	0.0044 0.0042 0.0036 0.0036 0.0042 0.0042 0.0280 0.0221	0.0044 0.0042 0.0051 0.0036 0.0042 0.0422 0.0422 0.0280 0.0369	0.0044 0.0042 0.0051 0.0036 0.0042 0.0280 0.0280 0.0280 0.0369	0.0044 0.0042 0.0036 0.0042 0.0422 0.0422 0.0280 0.0280 0.0369	0.0044 0.0051 0.0055 0.0036 0.0422 0.0280 0.0280 0.0280 0.0369	0.0044 0.0042 0.0051 0.0036 0.0422 0.0422 0.0280 0.0280 0.0280
1.46711 1.46723		1.46718	1.46718 1.46726 1.46726	0.00025 1.46718 1.46726 1.46720 1.46716	0.00020 1.46718 1.46726 1.46716 1.46716	1.46718 1.46726 1.46726 1.46716 1.46716 1.46719	0.00008 0.00008 0.00008	0.00008 0.00008 0.00008 0.00008	0.00008 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 1.46725	0.00025 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 0.00008 1.46725 1.46767	0.00023 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 1.46767 1.46702	0.0002 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 1.46725 1.46767 1.46767 1.46686	0.00025 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 0.00008 1.46725 1.46767 1.46767 1.46686	0.0002 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 1.46725 1.46725 1.46767 1.46767 1.46725 1.46720 1.46720	0.00020 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 1.46767 1.46702 1.46767 1.46767 1.46767 1.46767 1.46767 1.46762 1.46686 1.46720 0.00070	0.00020 1.46718 1.46726 1.46716 1.46716 1.46719 0.00008 1.46702 1.46702 1.46702 1.46702 1.46720 0.00070
10.10		11.12	11.12 12.60	11.12 12.60 9.08 8.32	11.12 12.60 9.08 8.32 10.60	11.12 12.60 9.08 8.32 10.60	11.12 12.60 9.08 8.32 10.60	11.12 12.60 9.08 8.32 10.60	11.12 12.60 9.08 8.32 10.60 13.42	11.12 12.60 9.08 8.32 10.60 13.42 9.34	11.12 12.60 9.08 8.32 10.60 13.42 9.34 14.80	11.12 12.60 9.08 8.32 10.60 10.60 13.42 9.34 14.80 13.12	11.12 12.60 9.08 8.32 10.60 13.42 9.34 13.12 13.12	11.12 12.60 9.08 8.32 10.60 13.42 9.34 14.80 13.12	11.12 12.60 9.08 8.32 10.60 13.42 9.34 14.80 13.12	11.12 12.60 9.08 8.32 10.60 13.42 9.34 14.80 13.12 13.12
27 12 27 12		3 21	)3 21 )3 21 23 21	)3 21 )3 21 )3 21 )3 21	3 21 3 21 3 21 3 21 3 21 3 21	3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21	)3 21 )3 21 )3 21 )3 21 )3 21 )3 21	13     21       13     21       13     21       13     21       13     21       13     21       13     21	3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21       3     21	13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       14     3	33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       33     21       4     3	13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       14     3	13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       14     3       14     3	13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       14     3       4     3	13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       13     21       14     3       2     3       2     3       3     21       13     21       14     3	matrix
16 102 102		42 100	42 100 51 100	42 100 51 100 27 100 31 100	21 100 51 100 27 100 31 100 32 100	42 100 51 100 31 100 32 100 52 100 100	42 100 51 100 31 100 32 100 52 100 100	42 100 51 100 31 100 52 100 52 100	42 100 51 100 31 100 32 100 99 92	42         100           51         100           31         100           32         100           39         92           38         92	42     100       51     100       31     100       32     100       33     92.       92     92.	42     100       51     100       31     100       32     100       33     92.       33     92.       32     92.	42     100       51     100       31     100       32     100       33     92,2       38     92,2       38     92,2       302     92,2       32     92,2	42     100       51     100       31     100       32     100       33     92.       92     92.       92     92.	42     100       51     100       31     100       32     100       33     92,       38     92,       92     92,       92     92,	100     100       101     100       102     922       102     922       103     922
26 8.` ]=5		·0- 6	9 0. 11 -0.4	9 -0.4 11 -0.4 22 0.5 24 -30.5	9 -0.4 11 -0.4 22 0.5 24 -3.1 27 3.6	9 -0.4 11 -0.4 22 0.2 24 -3.1 27 3.6	9 -0.4 11 -0.4 22 0.5 24 -3.5 27 3.6	9 -0.4 111 -0.4 22 -3.5 27 3.6	9 -0.4 11 -0.5 22 0.2 24 -3.5 27 3.6 14 2.5	9 -0.4 11 -0.4 22 0.2 24 -3.5 27 3.6 16 -1.5 16 -1.5	9 -0.4 11 -0.4 22 0.2 24 -3.3 27 3.6 16 -1.5 4 -1.5	9 -0.4 11 -0.4 22 0.2 27 -3.6 27 -1.1 16 -1.1 7 28.	9 -0.4 11 -0.1 22 0.2 24 -3.5 27 3.6 16 -1.5 7 28.	9 -0.4 22 0.2 24 -3.5 27 3.6 16 -1.1 7 28. 1= 7 28.	9 -0.4 11 -0.4 11 -0.4 22 0.2 27 3.6 16 -1.5 16 -1.5 16 -1.5 16 -1.5 16 -1.5 16 -1.5 16 -1.5 17 - 28.	9 -0.4 22 -0.5 23 -0.5 24 -3.5 16 -1.5 16 -1.5 17 -2.5 17 -2.5 17 -2.5 17 -2.5 17 -2.5 17 -2.5 16 -1.5 17 -2.5 16 -1.5 17 -2.5 16 -1.5 17 -2.5 17 -2.5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
3218 3218 r		)G275	)6275 )6275 )6275	)G275 )G275 )G275 )G275	)G275 )G275 )G275 )G275 )G275	)G275 )G275 )G275 )G275 )G275 )G275	JG275 JG275 JG275 JG275 JG275 JG275	JG275 JG275 JG275 JG275 JG275 JG275	36275 36275 36275 36275 36275 36275 1	JG275 JG275 JG275 JG275 JG275 JG275 r JG641	JG275 JG275 JG275 JG275 JG275 JG275 JG641 JG641	36275 36275 36275 36275 36275 36275 1 36641 36641 36641	JG275 JG275 JG275 JG275 JG275 JG641 JG641 JG641 JG641	JG275 JG275 JG275 JG275 JG275 JG275 r JG641 DG641 DG641 DG641 JG641 JG641	JG275 JG275 JG275 JG275 JG275 JG275 JG641 JG641 JG641 JG641 JG641 JG641	JG275 JG275 JG275 JG275 JG275 JG275 JG641 JG641 JG641 JG641 JG641 JG641 JG641 JG641 JG641 JG641

$TDM_{\mathrm{c}}$	1725	1802	1786	1773	1742			1845	1757	1846	1782	1757	1863	1852	1872	1805	1830	1866	1836	1857	1788	1730
2σ	1.01	1.11	1.12	1.06	1.21			1.05	0.83	0.91	0.76	0.99	0.68	1.74	1.57	0.86	1.59	1.60	1.65	1.51	1.52	0.70
εHf <sub>(int)</sub>	2.34	1.10	1.36	1.58	2.07	1.81	0.95	0.32	1.73	0.31	1.34	1.73	0.05	0.22	-0.11	0.97	0.57	-0.01	0.47	0.13	1.24	2.16
<sup>176</sup> Hf/ <sup>177</sup> Hfap			0.282170		0.282198			0.282150		0.282147		0.282191	0.282144	0.282151	0.282147		0.282156	0.282145	0.282153	0.282142	0.282179	0.282201
<sup>176</sup> Hf/ <sup>177</sup> Hfint	0.282188	0.282154	0.282161	0.282167	0.282181	0.282174	0.000027	0.282136	0.282176	0.282136	0.282165	0.282176	0.282128	0.282133	0.282124	0.282154	0.282143	0.282127	0.282140	0.282130	0.282162	0.282188
1σ%	26.64	26.87	27.22	26.66	26.70			26.61	1.46	26.63	3.97	26.60	1.68	16.51	16.24	1.68	16.42	16.21	16.18	16.21	16.54	1.37
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.000350	0.000602	0.000488	0.000432	0.000890	0.000628	0.000585	0.000733	0.000729	0.000595	0.000780	0.000796	0.000812	0.000890	0.001157	0.000553	0.000647	0.000922	0.000629	0.000566	0.000851	0.000670
1σ%	13.31	18.55	25.31	14.18	19.50			12.93	1.47	14.76	8.22	12.42	5.01	18.42	17.07	6.19	17.53	17.02	17.07	17.01	17.57	4.03
<sup>176</sup> Yb/ <sup>177</sup> Hf	0.008388	0.020207	0.016284	0.014291	0.034406	0.021915	0.027435	0.032293	0.034987	0.026132	0.025846	0.035032	0.032993	0.014878	0.012888	0.028048	0.013608	0.013418	0.014218	0.012888	0.012726	0.033954
1σ%	0.0087	0.0093	0.0096	0.0091	0.0098			0.0076	0.0067	0.0065	0.0059	0.0069	0.0051	0.0149	0.0129	0.0070	0.0136	0.0134	0.0142	0.0129	0.0127	0.0054
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.282195	0.282165	0.282170	0.282175	0.282198	0.282186	0.000030	0.282150	0.282190	0.282147	0.282180	0.282191	0.282144	0.282151	0.282147	0.282165	0.282156	0.282145	0.282153	0.282142	0.282179	0.282201
1σ%	0.0042	0.0046	0.0057	0.0048	0.0049			0.0041	0.0036	0.0042	0.0034	0.0038	0.0036	0.0257	0.0179	0.0040	0.0198	0.0184	0.0229	0.0198	0.0198	0.0040
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46723	1.46727	1.46721	1.46725	1.46720	1.46724	0.00009	1.46725	1.46719	1.46728	1.46725	1.46731	1.46725	1.46766	1.46716	1.46731	1.46713	1.46711	1.46730	1.46710	1.46702	1.46717
Tot.Hf	8.99	6.13	6.21	6.53	5.11			7.02	5.84	7.13	6.38	8.53	7.23	8.94	7.50	6.46	8.58	9.28	8.92	9.42	9.59	7.02
1σ	ю	с	ю	З	с	С		7	7	7	7	7	7	7	7	7	۲	7	7	7	7	7
Age	1046	1046	1046	1046	1046	1046		1039	1039	1039	1039	1039	1039	1039	1039	1039	1039	1039	1039	1039	1039	1039
Disc.			2.81		0.39			0.13		0.20		0.55	0.55	3.04	0.37		2.71	-3.85	0.96	0.26	-2.00	0.77
Zircon	11.4	11.10	12.12	12.4	12.13	n=7		7	7	7	7	11	1	12	13	14	15	16	18	19	22	24
Sample	ROG80	ROG80	ROG80	ROG80	ROG80	ROG80		SA3-01														

A	p	pe	2N	ıd	iл	(
	r 1					

$TDM_{\mathrm{c}}$	1812	1899	1787	1813		
2σ	0.73	1.74	1.67	1.53		
εHf <sub>(int)</sub>	0.86	-0.54	1.26	0.84	0.71	1.45
<sup>176</sup> Hf/ <sup>177</sup> Hfap	0.282165	0.282129	0.282180	0.282165		
<sup>176</sup> Hf/ <sup>177</sup> Hfint	0.282151	0.282112	0.282162	0.282150	0.282147	0.000041
1 <del>0</del> %	1.37	16.18	16.20	17.01		
<sup>176</sup> Lu/ <sup>177</sup> Hf	0.000714	0.000858	0.000875	0.000722	0.000763	0.000293
1σ%	7.03	17.04	17.01	18.20		
$^{176}$ Yb/ $^{177}$ Hf	0.033255	0.014879	0.014217	0.012888	0.022060	0.018886
1ơ%	0.0056	0.0149	0.0142	0.0129		
<sup>176</sup> Hf/ <sup>177</sup> Hf	0.282165	0.282129	0.282180	0.282165	0.282162	0.000040
1ơ%	0.0029	0.0208	0.0167	0.0175		
<sup>178</sup> Hf/ <sup>177</sup> Hf	1.46721	1.46703	1.46719	1.46704	1.46721	0.00029
Tot.Hf	8.10	8.78	7.49	10.23		
1σ	7	2	7	7	7	
Age	1039	1039	1039	1039	1039	
Disc.	0.37	0.49	4.07	-0.03		
Zircon	29	38	4	45	n=19	
Sample	SA3-01	SA3-01	SA3-01	SA3-01	SA3-01	

Table 10.5. LA-ICP-MS in-situ hafnium in zircon data. Disc. = % ( $^{206}$ Pb/ $^{238}$ U)/( $^{207}$ Pb/ $^{206}$ Pb), Tot. Hf = total hafnium signal in mV,  $^{176}$ Hf/ $^{177}$ Hf<sub>int</sub> = time-corrected ratio using the intrusion age,  $^{176}$ Hf/ $^{177}$ Hf<sub>ap</sub>= time-corrected ratio using the zircon  $^{207}$ Pb/ $^{206}$ Pb age, Age =  $^{207}$ Pb/ $^{206}$ Pb, disc. = % ( $^{206}$ Pb/ $^{238}$ U)/( $^{207}$ Pb/ $^{206}$ Pb), TDM<sub>C</sub> = two stage model age using Lu/Hf = 0.015. Means (non-italics) and 2.s.d. (italics) are shown after each sample.

analyses no	arain no	n	<sup>18</sup> O/ <sup>16</sup> O	160 %	<sup>18</sup> 0/ <sup>16</sup> 0	160 %	δ <sup>18</sup> Ο [%]
anaryses no.	gran no.		(measured)	13.6. /0	(corrected)	13.6. /0	
07/08/2008			(incusureu)		(corrected)		1011011
01500	15	10	0 0020284	0 0088	0 0020272	0 0088	10.65
91500	15	6	0.0020204	0.0000	0.0020272	0.0000	0.00
91500	15	5	0.0020242	0.0120	0.0020257	0.0120	9.32
91500	15	Э	0.0020251	0.0122	0.0020252	0.0122	10.04
MM2244	10.2		0.0020102	0 0 0 0 0 0	0.0020250	0 0200	7 00
	10.3		0.0020193	0.0200	0.0020250	0.0200	7.23
	10.3		0.0020173	0.0090	0.0020250	0.0090	0.27
IVIIVI2241	10.4		0.0020186	0.0101	0.0020249	0.0101	6.90
IVIIVI2241	10.7		0.0020196	0.0095	0.0020249	0.0095	7.45
MM2241	10.8		0.0020185	0.0099	0.0020248	0.0099	6.92
MM2241	10.9		0.0020174	0.0103	0.0020247	0.0103	6.44
MM2241	9.8		0.0020190	0.0148	0.0020247	0.0148	7.22
MM2241	9.7		0.0020213	0.0091	0.0020246	0.0091	8.39
MM2241	9.5		0.0020172	0.0088	0.0020246	0.0088	6.38
MM2241	9.2		0.0020184	0.0168	0.0020248	0.0168	6.87
91500	15	10	0.0020243	0.0096	0.0020239	0.0096	10.28
MM2235	6.1		0.0020219	0.0110	0.0020236	0.0110	9.21
MM2235	5.1		0.0020197	0.0107	0.0020236	0.0107	8.12
MM2235	5.2		0.0020207	0.0105	0.0020235	0.0105	8.68
MM2235	5.3		0.0020207	0.0084	0.0020235	0.0084	8.69
MM2235	5.4		0.0020206	0.0110	0.0020234	0.0110	8.66
MM2235	5.5		0.0020212	0.0130	0.0020234	0.0130	9.00
MM2235	5.6		0.0020186	0.0084	0.0020233	0.0084	7.70
MM2235	6.7		0.0020224	0.0073	0.0020233	0.0073	9.65
MM2235	5.9		0.0020205	0.0153	0.0020232	0.0153	8.71
MM2235	5 11		0.0020191	0.0106	0.0020232	0.0106	8.05
MINELOO	0.11		0.0020101	0.0100	0.0020202	0.0100	0.00
91500	15	10	0.0020232	0.0125	0.0020225	0.0125	10.42
08/08/2008							
91500	15	10	0.0020248	0.0148	0.0020249	0.0148	10.00
91500	15	10	0.0020245	0.0137	0.0020248	0.0137	9.93
KIM	9	10	0.0020137	0.0152	0.0020247	0.0152	4.55
91500	15	10	0.0020246	0.0123	0.0020246	0.0123	10.03
91500	1	10	0.0020253	0.0121	0.0020246	0.0121	10.43
POC525	24		0.0020168	0.0106	0 0020245	0.0106	6 20
ROG525	12		0.0020108	0.0100	0.0020245	0.0100	0.20
ROG525	13		0.0020174	0.0100	0.0020245	0.0100	0.55
RUG020	4		0.0020160	0.0143	0.0020245	0.0143	5.65
ROG525	10		0.0020109	0.0109	0.0020245	0.0109	0.20
RUG525	20		0.0020164	0.0073	0.0020245	0.0073	6.02
RUG525	20		0.0020173	0.0134	0.0020245	0.0134	6.50
RUG525	9		0.0020179	0.0151	0.0020245	0.0151	6.79
RUG525	8		0.0020176	0.0128	0.0020245	0.0128	6.65
ROG525	10		0.0020174	0.0115	0.0020244	0.0115	6.55
ROG525	11		0.0020163	0.0160	0.0020244	0.0160	6.00
ROG525	10		0.0020173	0.0066	0.0020244	0.0066	6.53
ROG525	13		0.0020164	0.0125	0.0020244	0.0125	6.08
91500	1	10	0.0020244	0.0126	0.0020244	0.0126	10.09
91500	1	5	0.0020243	0.0112	0.0020242	0.0112	10.09
91500	1	5	0.0020235	0.0129	0.0020241	0.0129	9.79
91500	1	10	0.0020239	0.0108	0.0020239	0.0108	10.07
09/08/2008	•	. 0					
91500	15	10	0.0020269	0.0188	0.0020263	0.0188	10.36
KIM	a	10	0.0020205	0.0005	0.0020203	0.0100	4 21
91500	15	5	0.0020147	0.0000	0.0020203	0.0000	10.30
31300	15	5	0.0020200	0.0099	0.0020203	0.0099	10.50
SA7 96	21		0.0020201	0 0125	0 0020262	0.0125	7.00
CA7 96	51		0.0020201	0.0120	0.0020203	0.0120	6.01
CA7 96	70		0.0020100	0.0034	0.0020203	0.0094	7 52
SA1-00	78		0.0020212	0.0140	0.0020203	0.0140	1.00
3A1-80	23		0.0020197	0.0130	0.0020203	0.0130	0.80

Table 10.6. Oxygen isotope data (Ionprobe) for Chapter 5.

analyses no.	grain no.	n	<sup>18</sup> O/ <sup>16</sup> O	1s.e. %	<sup>18</sup> O/ <sup>16</sup> O	1s.e. %	δ <sup>18</sup> Ο [‰]
	U		(measured)		(corrected)		VSMOW
SA7.96	22		0.0020108	0.0100	0.0020262	0.0100	6 80
SA7-00	22		0.0020198	0.0109	0.0020203	0.0109	0.00
SA7-80	27		0.0020194	0.0139	0.0020263	0.0139	6.65
SA7-86	40		0.0020204	0.0126	0.0020263	0.0126	7.13
SA7-86	36a		0.0020191	0.0100	0.0020263	0.0100	6.48
SA7-86	44		0.0020196	0.0130	0.0020263	0.0130	6.75
91500	15	10	0 0020279	0 0244	0.0020263	0 0244	10.85
01500	15	0	0.0020260	0.0080	0.0020262	0.0080	0.00
31300	15	0	0.0020200	0.0003	0.0020203	0.0003	3.30
SA3-60	8		0.0020200	0.0124	0.0020263	0.0124	6.93
SA3-60	2		0.0020192	0.0093	0.0020263	0.0093	6.53
SA7-04	b1		0.0020255	0.0247	0.0020263	0.0247	9.67
SA7-04	b2		0.0020210	0.0155	0.0020263	0.0155	7.42
SA7-04	b4		0.0020192	0.0112	0.0020263	0.0112	6.53
SA7-04	b6		0 0020174	0.0067	0.0020263	0.0067	5.61
SA7 04	60 67		0.0020174	0.0007	0.0020200	0.0007	0.01
3A7-04	07		0.0020234	0.0100	0.0020203	0.0100	0.59
		_					
91500	15	5	0.0020261	0.0092	0.0020263	0.0092	9.95
SA7-86	36b		0.0020206	0.0094	0.0020263	0.0094	7.20
SA7-86	36c		0.0020199	0.0135	0.0020263	0.0135	6.88
SA7-86	11		0.0020192	0.0086	0.0020263	0.0086	6 52
SA7 96	12		0.0020102	0.0005	0.0020200	0.0005	6.75
SA7-00	75		0.0020197	0.0095	0.0020203	0.0095	0.75
SA7-86	70		0.0020192	0.0124	0.0020263	0.0124	6.52
SA7-86	28		0.0020204	0.0112	0.0020263	0.0112	7.11
SA7-86	29		0.0020203	0.0077	0.0020263	0.0077	7.09
91500	15	10	0.0020264	0.0098	0.0020263	0.0098	10.11
10/08/2009							
01500	10	0	0 0020275	0.0127	0 0020270	0.0127	10.20
91500	13	9	0.0020275	0.0137	0.0020270	0.0137	10.29
91500	13	10	0.0020270	0.0136	0.0020272	0.0136	9.94
KIM	9	10	0.0020165	0.0137	0.0020274	0.0137	4.65
91500	13	8	0.0020272	0.0143	0.0020276	0.0143	9.87
SA7-91	4		0.0020186	0.0160	0.0020277	0.0160	5.53
SA7-01	5		0.0020185	0.0152	0.0020277	0.0152	5.48
CA7 04	5		0.0020103	0.0152	0.0020277	0.0152	5.40
SA7-91	0		0.0020190	0.0153	0.0020277	0.0153	5.70
SA7-91	14		0.0020194	0.0162	0.0020277	0.0162	5.90
SA7-91	21		0.0020179	0.0147	0.0020278	0.0147	5.18
SA7-91	3		0.0020190	0.0141	0.0020278	0.0141	5.71
SA7-91	9		0.0020174	0.0094	0.0020278	0.0094	4.88
SA7-91	12		0.0020161	0.0178	0 0020278	0.0178	4 24
SA7 01	17		0.0020101	0.0176	0.0020270	0.0176	5.70
SA1-91	17		0.0020193	0.0120	0.0020270	0.0120	5.79
SA7-91	30		0.0020196	0.0121	0.0020279	0.0121	5.96
SA7-91	31		0.0020181	0.0144	0.0020279	0.0144	5.18
SA7-91	33		0.0020180	0.0144	0.0020279	0.0144	5.16
SA7-91	32		0.0020189	0.0143	0.0020279	0.0143	5.57
SA7-91	20		0.0020193	0.0082	0.0020279	0.0082	5.77
SA7-91	27		0.0020187	0.0139	0.0020280	0.0139	5.45
0/11/01			0.0020101	0.0100	0.0020200	0.0100	0.10
04500	40	•	0.000000	0.0454	0.0000000	0.0454	40.40
91500	13	8	0.0020282	0.0154	0.0020280	0.0154	10.13
SA3-04	46		0.0020238	0.0145	0.0020281	0.0145	7.90
SA3-04	39a		0.0020238	0.0182	0.0020282	0.0182	7.89
SA3-04	39b		0.0020238	0.0116	0.0020282	0.0116	7.90
SA3-04	19		0.0020231	0.0166	0.0020282	0.0166	7.52
SV 2-01	20		0.0020207	0.01/1	0.002020202	0.01/1	7 1 9
CA3 04	20		0.0020224	0.0145	0.0020202	0.0141	0.00
5A3-04	3		0.0020254	0.0145	0.0020282	0.0145	0.00
SA3-04	59		0.0020238	0.0113	0.0020283	0.0113	7.86
SA3-04	17		0.0020240	0.0115	0.0020283	0.0115	7.92
SA3-04	34		0.0020230	0.0149	0.0020283	0.0149	7.42
SA3-04	60		0.0020253	0.0191	0.0020284	0.0191	8.53
SA3-04	512		0.0020246	0 0173	0 0020284	0.0173	8 21
CA2 04	510		0.0020240	0.0170	0.0020204	0.0175	0.21
343-04	arc		0.0020249	0.0176	0.0020284	0.0170	0.30
91500	13	10	0.0020286	0.0173	0.0020285	0.0173	10.12

analvses no.	grain no.	n	<sup>18</sup> O/ <sup>16</sup> O	1s.e. %	<sup>18</sup> O/ <sup>16</sup> O	1s.e. %	δ <sup>18</sup> Ο [‰]
<b>,</b>	<b>J</b>		(measured)		(corrected)		VSMOW
07/08/2008			(		(00110000)		
01500	15	10	0 00202828	0 0088	0 00202722	0 0088	10.65
91500	15	6	0.00202030	0.0000	0.00202722	0.0000	10.05
91500	15	0	0.00202417	0.0126	0.00202567	0.0126	9.32
91500	15	5	0.00202510	0.0122	0.00202516	0.0122	10.04
500.00							
ROG 80	11.10		0.00201933	0.0200	0.00202501	0.0200	7.23
ROG 80	11.11		0.00201734	0.0090	0.00202496	0.0090	6.27
ROG 80	11.14		0.00201857	0.0101	0.00202492	0.0101	6.90
ROG 80	11.2		0.00201961	0.0095	0.00202487	0.0095	7.45
ROG 80	11.4		0.00201851	0.0099	0.00202482	0.0099	6.92
ROG 80	12.1		0.00201744	0.0103	0.00202472	0.0103	6.44
ROG 80	12.12		0.00201897	0.0148	0.00202467	0.0148	7.22
ROG 80	12.4		0.00202126	0.0091	0.00202463	0.0091	8.39
ROG 80	12.5		0.00201717	0.0088	0.00202458	0.0088	6.38
MM2241	10.3		0.00201836	0.0168	0 00202477	0.0168	6.87
MM2241	10.0		0.00201625	0.0078	0.00202477	0.0100	5.04
MM2241	10.3		0.00201020	0.0070	0.00202433	0.0070	5.09
	10.4		0.00201029	0.0098	0.00202448	0.0098	5.90
MIM2241	10.7		0.00201488	0.0090	0.00202443	0.0090	5.31
MM2241	10.8		0.00201688	0.0086	0.00202438	0.0086	6.32
MM2241	10.9		0.00201617	0.0144	0.00202433	0.0144	6.00
MM2241	9.8		0.00201693	0.0320	0.00202429	0.0320	6.40
MM2241	9.7		0.00201819	0.0124	0.00202424	0.0124	7.05
MM2241	9.5		0.00201472	0.0083	0.00202419	0.0083	5.34
MM2241	9.2		0.00201376	0.0109	0.00202414	0.0109	4.89
91500	15	10	0.00202429	0.0096	0.00202387	0.0096	10.28
91500	15	10	0.00202322	0.0125	0.00202251	0.0125	10.42
08/08/2008							
91500	15	10	0 00202475	0 0148	0 00202489	0 0148	10.00
91500	15	10	0.00202473	0.0140	0.00202409	0.0140	0.02
91500	15	10	0.00202432	0.0157	0.00202460	0.0157	9.93
	9	10	0.00201367	0.0152	0.00202472	0.0152	4.55
91500	15	10	0.00202457	0.0123	0.00202464	0.0123	10.03
91500	1	10	0.00202528	0.0121	0.00202456	0.0121	10.43
91500	1	10	0.00202441	0.0126	0.00202438	0.0126	10.09
MM26306	26		0.00202797	0.0129	0.00202433	0.0129	11.88
MM26306	23		0.00202776	0.0129	0.00202433	0.0129	11.78
MM26306	3		0.00202696	0.0135	0.00202432	0.0135	11.39
MM26306	21		0.00202725	0.0141	0.00202431	0.0141	11.54
MM26306	7		0.00202783	0.0137	0.00202430	0.0137	11.83
MM26306	17		0.00202760	0.0113	0.00202429	0.0113	11.72
MM26306	12		0.00202637	0.0126	0.00202428	0.0126	11.11
MM26306	13		0.00202729	0.0141	0.00202428	0.0141	11 58
MM26306	15		0.00202720	0.0141	0.00202420	0.0141	11.00
MM26206	10		0.00202037	0.0113	0.00202427	0.0113	12.00
10110120300	10		0.00202032	0.0107	0.00202420	0.0107	12.09
01500	1	5	0 00202427	0.0112	0.00002424	0.0112	10.00
91500	I	5	0.00202427	0.0112	0.00202424	0.0112	10.09
			0 0000 1701		0 00000 404		
IVIIVI26302	26		0.00201781	0.0104	0.00202421	0.0104	88.0
MM26302	27		0.00201963	0.0116	0.00202420	0.0116	7.79
MM26302	25		0.00201804	0.0118	0.00202419	0.0118	7.00
MM26302	17		0.00201601	0.0155	0.00202419	0.0155	5.99
MM26302	13		0.00201564	0.0167	0.00202418	0.0167	5.81
MM26302	10		0.00201705	0.0083	0.00202417	0.0083	6.52
MM26302	11		0.00201754	0.0083	0.00202416	0.0083	6.77
MM26302	5		0.00201727	0.0123	0.00202415	0.0123	6.64
MM26302	6		0.00201493	0.0115	0.00202414	0.0115	5.47
MM26302	4		0.00201801	0.0104	0.00202413	0.0104	7.02
	·		5.00201001	0.0101	0.00202110	0.0101	
91500	1	5	0.00202354	0.0129	0.00202410	0.0129	9.79

Table 10.7. Oxygen isotope data (Ionprobe) for Chapter 6

analyses no.	grain no.	n	<sup>18</sup> O/ <sup>16</sup> O	1s.e. %	<sup>18</sup> O/ <sup>16</sup> O	1s.e. %	δ <sup>18</sup> Ο [‰]
-	-		(measured)		(corrected)		VSMOW
MM26302	18		0.00201750	0.0106	0.00202408	0.0106	6.79
MM26302	16		0.00201749	0.0168	0.00202407	0.0168	6.79
ROG 641	14		0.00201773	0.0163	0.00202406	0.0163	6.91
ROG 641	16		0.00201927	0.0112	0.00202406	0.0112	7.68
ROG 641	4		0.00201756	0.0129	0.00202405	0.0129	6.83
ROG 641	7		0.00201759	0.0104	0.00202404	0.0104	6.85
91500	1	10	0.00202392	0.0108	0.00202392	0.0108	10.07
09/08/2008							
91500	15	10	0.00202687	0.0188	0.00202630	0.0188	10.36
KIM	9	10	0.00201474	0.0095	0.00202630	0.0095	4.31
91500	15	5	0.00202677	0.0099	0.00202631	0.0099	10.30
91500	15	10	0.00202787	0.0244	0.00202631	0.0244	10.85
SA3-01	16		0.00201967	0.0184	0.00202631	0.0184	6.76
SA3-01	15		0.00201938	0.0143	0.00202631	0.0143	6.62
SA3-01	10		0.00201709	0.0144	0.00202631	0.0144	5.48
SA3-01	19a		0.00201938	0.0144	0.00202631	0.0144	6.62
SA3-01	18		0.00201797	0.0127	0.00202631	0.0127	5.91
SA3-01	7		0.00201972	0.0087	0.00202631	0.0087	6.78
SA3-01	22		0.00202004	0.0140	0.00202631	0.0140	6.94
SA3-01	24		0.00201923	0.0145	0.00202631	0.0145	6.54
SA3-01	45		0.00201871	0.0138	0.00202631	0.0138	6.28
SA3-01	38		0.00201995	0.0137	0.00202631	0.0137	6.90
SA3-01	33a		0.00201930	0.0129	0.00202631	0.0129	6.57
91500	15	8	0.00202598	0.0089	0.00202631	0.0089	9.90
91500	15	5	0.00202608	0.0092	0.00202632	0.0092	9.95
0.4.0.04	47		0.00004000	0.0404		0.0404	0.40
SA3-01	17		0.00201908	0.0104	0.00202632	0.0104	6.46
SA3-01	13		0.00201894	0.0120	0.00202632	0.0120	6.39
SA3-01	5		0.00201807	0.0098	0.00202632	0.0098	5.96
SA3-01	4		0.00201798	0.0064	0.00202632	0.0064	5.92
SA3-01	12a		0.00201983	0.0124	0.00202632	0.0124	6.84
SA3-01	12b		0.00202002	0.0121	0.00202632	0.0121	6.93
SA3-01	33D		0.00202030	0.0089	0.00202632	0.0089	7.07
SA3-01	330		0.00201981	0.0090	0.00202632	0.0090	6.82
SA3-01	190		0.00202046	0.0104	0.00202632	0.0104	7.15
91500	15	10	0.00202640	0.0098	0.00202632	0.0098	10.11
10/08/2009							
91500	13	9	0.0020275	0.0137	0.0020270	0.0137	10.29
91500	13	10	0.0020270	0.0136	0.0020272	0.0136	9.94
KIM	9	10	0.0020165	0.0137	0.0020274	0.0137	4.65
91500	13	8	0.0020272	0.0143	0.0020276	0.0143	9.87
91500	13	8	0.0020282	0.0154	0.0020280	0.0154	10.13
91500	13	10	0.0020286	0.0173	0.0020285	0.0173	10.12

Corrected values are normalised to the daily average (or regressed value if drift is recognised) of the 91500 standard. 91500 and KIM are bracketing standards.  $\delta^{18}$ O is reported relative to the VMSOW.

CL images of zircons analysed in Chapter 8.








## Appendix



	Wt.	U	Th	Pb	$^{206}\text{Pb}*$	mol %	Pb*	$Pb_c$	$^{206}Pb$	$^{208}\text{Pb}$	$^{207}$ Pb		$^{207}$ Pb		$^{206}Pb$		corr.	$^{207}$ Pb		$^{207}$ Pb		<sup>206</sup> Pb	
Sample	mg	mqq	U	mqq	x10 <sup>-13</sup> mol	$^{206}\text{Pb}*$	$\operatorname{Pb}_{\mathrm{c}}$	(bg)	$^{204}$ Pb	<sup>206</sup> Pb	$^{206}\text{Pb}$	% err	$^{235}$ U	% err	$\mathrm{U}^{238}\mathrm{U}$	% err	coef.	$^{206}$ Pb	+1	<sup>235</sup> U	+1	$^{238}$ U	+1
(a)	(q)	(c)	(p)	(c)	(e)	(e)	(e)	(e)	(f)	(g)	(g)	(h)	(g)	(h)	(g)	(h)		(i)	(h)	(i)	(h)	(i)	(h)
SA7-130																							
zl	0.100	ŝ	0.346	0.8	3.1891	99.84%	189	0.42	11654	0.103	0.093124	0.087	3.269735	0.172	0.254654	0.092	0.963	1490.30	1.65	1473.88	1.34 1	462.51	1.20
z2	0.100	7	0.334	0.5	2.1483	99.69%	98	0.54	6054	0.099	0.093799	0.098	3.372681	0.187	0.260782	0.103	0.931	1503.95	1.85	1498.07	1.46 1	493.92	1.37
z3	0.100	1	0.324	0.4	1.4674	99.16%	35	1.03	2183	0.096	0.093852	0.130	3.385343	0.230	0.261611	0.119	0.914	1505.04	2.47	1501.01	1.80 1	498.16	1.59
z4	0.100	2	0.331	0.4	1.6880	98.72%	22	1.85	1355	0.099	0.093548	0.138	3.348150	0.257	0.259578	0.157	0.888	1498.90	2.60	1492.36 2	2.01 1	487.76	2.08
z5	0.100	2	0.261	0.5	1.9410	99.78%	134	0.35	8424	0.080	0.090460	0.090	2.922152	0.186	0.234287	0.111	0.938	1435.13	1.73	1387.66	1.41 1	357.01	1.35
z6	0.100	1	0.280	0.3	1.1868	99.42%	50	0.57	3172	0.083	0.093859	0.123	3.377685	0.215	0.261001	0.116	0.893	1505.17	2.33	1499.23	1.68 1	495.04	1.55
zΤ	0.100	2	0.355	0.5	1.8761	99.53%	64	0.73	3922	0.106	0.093690	0.108	3.365712	0.206	0.260544	0.119	0.913	1501.77	2.05	1496.45	1.61 1	492.70	1.59
z8	0.100	1	0.323	0.3	1.3089	99.16%	35	0.91	2200	0.097	0.092596	0.114	3.192440	0.237	0.250051	0.137	0.954	1479.53	2.15	1455.33	1.83 1	438.81	1.77
SA7-91																							
z2	0.100	4	0.428	1.2	4.5213	99.35%	45	2.53	2614	0.127	0.093746	0.127	3.384309	0.263	0.262	0.195	0.887	1502.89	2.40	1500.77 2	2.06 1	499.27	2.61
z4	0.100	11	0.450	3.0	11.6964	99.89%	277	1.07	16579	0.134	0.093713	0.089	3.363773	0.175	0.260	0.098	0.942	1502.22	1.68	1496.00	1.37 1	491.61	1.30
z5	0.100	4	0.424	1.1	4.2124	99.42%	51	2.09	2967	0.127	0.093858	0.156	3.291354	0.229	0.254	0.111	0.790	1505.15	2.95	1479.01	1.78 1	460.86	1.46
z6	0.100	7	0.405	1.8	7.3290	99.85%	209	0.88	12679	0.121	0.093704	0.089	3.357601	0.171	0.260	0.090	0.958	1502.06	1.68	1494.56	1.34 1	489.29	1.19
SA3-02																							
z2	0.100	7	0.389	1.9	7.5389	99.76%	124	1.52	7391	0.115	0.094183	0.090	3.417420	0.247	0.263	0.198	0.941	1511.67	1.70	1508.41 1	1.94 1	506.08	2.66
z4	0.100	4	0.345	1.1	4.3370	99.71%	102	1.05	6275	0.102	0.094217	0.091	3.427897	0.178	0.264	0.095	0.962	1512.37	1.72	1510.81 1	1.40 1	509.70	1.27
z5	0.100	9	0.259	1.6	6.6046	99.85%	197	0.81	12441	0.077	0.094125	0.093	3.372285	0.174	0.260	0.091	0.943	1510.51	1.75	1497.98	1.36 1	489.14	1.22
z6	0.100	7	0.362	2.0	7.9801	%06.66	306	0.65	18754	0.107	0.094110	0.086	3.404473	0.175	0.262	0.101	0.946	1510.22	1.62	1505.43 1	1.38 1	502.03	1.36
SA7-58																							
zl	0.100	9	0.583	1.2	4.5559	99.71%	109	1.08	6422	0.177	0.074187	0.102	1.802530	0.183	0.176	0.090	0.942	1046.41	2.07	1046.38 1	1.19 1	046.36 (	0.87
z2	0.100	6	0.628	1.7	6.4245	99.84%	196	0.85	11442	0.191	0.074205	0.087	1.794728	0.172	0.175	0.090	0.970	1046.91	1.76	1043.54 ]	1.12 1	041.94 (	0.87
z3	0.100	7	0.746	1.4	5.0007	99.68%	101	1.34	5600	0.228	0.074198	0.095	1.779602	0.178	0.174	0.087	0.974	1046.70	1.91	1038.03	1.16 1	033.92 (	0.84
z4	0.100	2	0.688	0.3	1.1736	98.75%	25	1.23	1446	0.209	0.074176	0.195	1.806816	0.324	0.177	0.185	0.843	1046.11	3.93	1047.93 2	2.12 1	048.80	1.79
SA7-86																							
z3	1.000	0	0.259	0.0	1.7726	99.80%	147	0.29	9285	0.077	0.093626	0.089	3.338161	0.178	0.259	0.099	0.951	1500.47	1.68	1490.02	1.39 1	482.70	1.31
z4	1.000	0	-0.030	0.0	1.7924	99.59%	99	0.61	4484	-0.009	0.093399	0.130	3.369258	0.207	0.262	0.106	0.848	1495.87	2.45	1497.28	1.62 1	498.27	1.41
z5	1.000	0	0.412	0.0	1.8425	99.64%	85	0.54	5190	0.122	0.093535	0.100	3.373934	0.192	0.262	0.109	0.928	1498.64	1.88	1498.36	1.51 1	498.17	1.46
z6	1.000	0	0.329	0.1	2.3091	99.75%	117	0.48	7277	0.098	0.093313	0.125	3.335091	0.322	0.259	0.274	0.925	1494.14	2.36	1489.31 2	2.51 1	485.92	3.63
LZ 5 4 7 04	1.000	0	0.471	0.1	3.5519	99.62%	81	1.12	4816	0.140	0.093963	0.096	3.398598	0.190	0.262	0.107	0.940	1507.27	1.82	1504.07	1.49 1	501.80	1.4
-04/-04				0					0.00								0000		ļ		, I		
IZ C2	0.100	4 -	6227.0 901.0	0.8	3.4137 1 7260	99.13% 07 95%	32 13	CC.7	706 706	0.0/1	0.001774	0.140	0013610	0.221	0.725	0.124	0.839	1461 56	7.07	1322.23	1 0/.1	261 28	6. F
1 5	0.100	- 6	1210	n r	6007-1	2005-00	3	7 C 7 C	0000	0.050	12/17/000	0.100	DIDC/C7	101.0	0000	1000	0000	02 2211	÷ -	1415 25 1		00 720	117
CZ F	0.100	- 9	1010	) - I - I - I - I - I - I - I - I - I - I	0.0044	%/C.66	00 03	50.7 52 C	5710	7CU.U	106260.0	0.006	11 CUCU.C	0.184	0.230	0.105	000.0 200 0	10.6741	1.94 1 80	1 00.0141	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	07.070 213.18	1.17
5 1	001.0	2 6	101.0	t u i c	7700.6	00.00	5 5	10.7	2110	6000	0.0200.0	0.000	247040.2	101.0	702.0	201.0	00000	10.0011	70.1	- +0.7 CT		01.040	17.1
Z0 T-1-1- 10 0	001.00		101.04	C.U	J-1-1-1	90.09%	17	6C.2	00001		0.069914	0.144	colccc.2	DC7:D	1	101.0	0.000	1423.30	10 12000	1	1 00.1	C0.041	1.17
1 able 10.8. estimated fi	U-PB (II	(CIMI 1-C	ata. (a) anhic era	z1, zz el in dimer	tc. are tabets t rsions adiuste	or Iracuoi 3d for nart	ns comp ial dissr	osed of	single zi Jurino ch	rcon gram emical ahr	s or tragmer	nts; all fr ominal I	ractions ann	Ph concer	trations su	y abrade	a arter b uncertai	vlattinson (. ntv in nhot	a) .(cuus anicros	) Nominal ranhic estii	Iraction	n weights of weight	bue
partial disse	alution dr	uring che	mical ahr	rasion. (c	4) Model Th/I	J ratio cal	culated	from ra	diogenic	<sup>208</sup> Ph/ <sup>206</sup> Ph	ratio and 2	07Ph/23	5U age. (e)	Ph* and	Phc renres	ent radio	genic an	d common	Ph. resr	ectively: n	nol % <sup>20</sup>	<sup>6</sup> Ph* with	
respect to ra	adiogenic	blank a	und initial	commo	n Pb. (f) Mea:	sured ratic	correct	ed for s	spike and	fractionati	on only. Da	lv analv	ses. based o	n analvsi	s of NBS-9	981 and ]	NBS-98	2. (g) Corr	ected for	r fractionat	tion. spi	ke. and	
common Pt	v: up to 1	pg of co	mmon Pb	) was ass	sumed to be p	rocedural	blank: <sup>2</sup>	${}^{06}Pb/{}^{204}$	Pb = 18.6	$0 \pm 0.80\%$	: <sup>207</sup> Pb/ <sup>204</sup> Pt	0 = 15.65	$9 \pm 0.32\%$ :	$^{208}Pb/^{204}F$	b = 38.51	$\pm 0.74\%$	(all unc	ertainties 1	-sigma).	Excess or	ver blan	k was	
assigned to	initial co	mmon P	b. (h) Err	ors are 2	?-sigma, prop	rgated usir	ng the a	leorithn	ns of Sch	mitz and S	choene (200	)7) and (	Crowlev et ¿	d. (2007)	. (i) Calcul	ations at	re based	on the deci	av consta	ants of Jaff	ev et al.	(1971).	
<sup>206</sup> Pb/ <sup>238</sup> U a	nd <sup>207</sup> Pb/	<sup>206</sup> Pb age	ss correcte	ed for in	itial disequilil	brium in <sup>25</sup>	<sup>30</sup> Th/ <sup>238</sup> t	J using	Th/U [m	agma] = 3.	(j) Correcte	ed for fra	actionation,	spike, an	d blank Pb	only.			•		•		

## **Bibliography**

- Åhäll, K.-I., Connelly, J., 1998. Intermittent 1.53-1.13 Ga magmatism in western Baltica; age constraints and correlations within a postulated supercontinent. Precambrian Research 92, 1-20.
- Åhäll, K.-I., Connelly, J.N., Brewer, T.S., 2000. Episodic rapakivi magmatism due to distal orogenesis?: Correlation of 1.69-1.50 Ga orogenic and inboard, 'anorogenic' events in the Baltic Shield. Geology 28, 823-826.
- Åhäll, K.-I., Connelly, J.N., 2008. Long-term convergence along SW Fennoscandia: 330 m.y. of Proterozoic crustal growth. Precambrian Research 161, 452-474.
- Åhäll, K.-I., Cornell, D.H., Armstrong, R.A., 1998. Ion probe dating of metasedimentary units across the Skagerrak: new constraints for early Mesoproterozoic growth of the Baltic Shield. Precambrian Research 87, 117-134.
- Åhäll, K.-I., Daly, J.S., Schöberg, H., 1990. Geochronological constraints on mid-Proterozoic magmatism in the Østfold-Marstrand belt; implications for crustal evolution in southwest Sweden. In Gower, C.F., Rivers, T., Ryan, B.(eds.) Mid-Proterozoic Laurentia-Baltica, Geological Association of Canada Special Paper 38, 97-115.
- Åhäll, K.-I., Larson, S.-Å., 2000. Growth-related 1.85-1.55 Ga magmatism in the Baltic Shield; a review addressing the tectonic characteristics of Svecofennian, TIB 1 -related, and Gothian events. GFF 122, 193-206.
- Åhäll, K.-I., Samuelsson, L., Persson, P.-O., 1997. Geochronology and structural setting of the 1.38 Ga Torpa granite; implications for charnockite formation in SW Sweden. GFF 119, 37-43.
- Ali, K.A., Stern, R.J., Manton, W.I., Johnson, P.R., Mukherjee, S.K., 2009a. Neoproterozoic diamictite in the Eastern Desert of Egypt and Northern Saudi Arabia: evidence of ~750 Ma glaciation in the Arabian-Nubian Shield? International Journal of Earth Science 99, 705-726.
- Ali, K.A., Stern, R.J., Manton, W.I., Kimura, J.-I., Khamees, H.A., 2009b. Geochemistry, Nd isotopes and U-Pb SHRIMP zircon dating of Neoproterozoic volcanic rocks from the Central Eastern Desert of Egypt: New insights into the ~750 Ma crust-forming event. Precambrian Research 171, 1-22.
- Alm, E., Kumpulainen, R., Sundblad, C., 1997. Mesoproterozoic sediment-hosted strata-bound copper deposits in the Dal Group, Sweden. In: Charlet, J.-M. (ed.): Proceedings of the International Cornet Symposium, Royal Academy of Overseas Sciences, Belgium, 217-243.
- Amelin, Y., Lee, D., Halliday, A.N., Pidgeon, R.T., 1999. Nature of the Earth's earliest crust from hafnium isotopes in single detrital zircons. Nature 399, 252-255.
- Andersen, T., 2005. Terrane analysis, regional nomenclature and crustal evolution in the Southwest Scandinavian Domain of the Fennoscandian Shield. GFF 127, 159-168.
- Andersen, T., 1997. Radiogenic isotope systematics of the Herefoss granite, South Norway: an indicator of Sveconorwegian (Grenvillian) crustal evolution in the Baltic Shield. Chemical Geology 135, 139-158.
- Andersen, T., Andersson, U.B., Graham, S., Åberg, G., Simonsen, S.L., 2009a. Granitic magmatism by melting of juvenile continental crust: New constraints on the source of Palaeoproterozoic granitoids in Fennoscandia from Hf isotopes in zircon. Journal of the Geological Society 166, 233-247.
- Andersen, T., Andresen, A., Sylvester, A.G., 2002a. Timing of late- to post-tectonic Sveconorwegian granitic magmatism in South Norway. NGU Bulletin 440, 5-18.

- Andersen, T., Andresen, A., Sylvester, A.G., 2001. Nature and distribution of deep crustal reservoirs in the southwestern part of the Baltic Shield: evidence from Nd, Sr and Pb isotope data on late Sveconorwegian granites. Journal of the Geological Society, London 158, 253-267.
- Andersen, T., Graham, S., Sylvester, A.G., 2007a. Timing and tectonic significance of Sveconorwegian A-type granitic magmatism in Telemark, southern Norway: New results from laser-ablation ICPMS U-Pb dating of zircon. NGU Bulletin 447, 17-31.
- Andersen, T., Graham, S., Sylvester, A.G., 2009b. The geochemistry, Lu-Hf isotope systematics, and petrogenesis of Late Mesoproterozoic A-type granites in southwestern Fennoscandia. Canadian Mineralogist 47, 1399-1422.
- Andersen, T., Griffin, W.L., 2004. Lu-Hf and U-Pb isotope systematics of zircons from the Storgangen intrusion, Rogaland Intrusive Complex, SW Norway: implications for the composition and evolution of Precambrian lower crust in the Baltic Shield. Lithos 73, 271-288.
- Andersen, T., Griffin, W.L., Jackson, S.E., Knudson, T.-L., Pearson, N.J., 2004a. Mid-Proterozoic magmatic arc evolution at the southwest margin of the Baltic Shield. Lithos 73, 289-318.
- Andersen, T., Griffin, W.L., Pearson, N.J., 2002b. Crustal Evolution in the SW part of the Baltic Shield: the Hf Isotope Evidence. Journal of Petrology 43, 1725-1747.
- Andersen, T., Griffin, W.L., Sylvester, A.G., 2007b. Sveconorwegian crustal underplating in southwestern Fennoscandia: LAM-ICPMS U-Pb and Lu-Hf isotope evidence from granites and gneisses in Telemark, southern Norway. Lithos 93, 273-287.
- Andersen, T., Hagelia, P., Whitehouse, M.J., 1994. Precambrian multi-stage crustal evolution in the Bamble sector of south Norway: Pb isotopic evidence from a Sveconorwegian deep-seated granitic intrusion. Chemical Geology 116, 327-343.
- Andersen, T., Laajoki, K., Saeed, A., 2004b. Age, provenance and tectonostratigraphic status of the Mesoproterozoic Blefjell quartzite, Telemark sector, southern Norway. Precambrian Research 135, 217-244.
- Anderson, I.C., Frost, C.D., Frost, B.R., 2003. Petrogenesis of the Red Mountain pluton, Laramie anorthosite complex, Wyoming: Implications for the origin of A-type granite. Precambrian Research 124, 243-267.
- Anderson, J.L., 1983. Proterozoic anorogenic granite plutonism of North America. Proterozoic Geology 161, 133-154.
- Andersson, J., Möller, C., Johansson, L., 2002. Zircon geochronology of migmatite gneisses along the Mylonite Zone (S Sweden): a major Sveconorwegian terrane boundary in the Baltic Shield. Precambrian Research 114, 121.
- Andersson, J., Söderlund, U., Cornell, D., Johansson, L., Möller, C., 1999. Sveconorwegian (-Grenvillian) deformation, metamorphism and leucosome formation in SW Sweden, SW Baltic Shield: constraints from a Mesoproterozoic granite intrusion. Precambrian Research 98, 151-171.

, P.-G., Rodhe, A., 1994. Ductile and brittle deformation within the Protogine Zone, southern Sweden: A discussion. GFF 116, 115-116.

- Andresen, A., 1974. Petrographic and structural history of the Caledonian rocks north of Haukelisæter, Hardangervidda. Norges Geologiske Undersøkelse 314, 1-52.
- Andresen, A., 1978. Lithostratigraphy of the autochthonous/parautochthonous Lower Palaeozoic metasediments on Hardangervidda, south Norway. Norges Geologiske Undersøkelse 338, 59-69.
- Andresen, A., Færseth, R., 1982. An evolutionary model for the southwest Norwegian Caledonides. American Journal of Science 282, 756-782.

- Andresen, A., Gabrielsen, R.H., 1979. Major element chemistry of metavolcanic rocks and tectonic setting of the Precambrian Dyrskard Group, Hardangervidda, south Norway. Norsk geologisk tidsskrift 49, 47-59.
- Andresen, A., Heier, K.S., 1975. A Rb-Sr whole rock isochron date on an igneous rock-body from the Stavanger area, South Norway. International Journal of Earth Science 64, 260-265.
- Andresen, A., Heier, K.S., Jorde, K., Naterstad, J., 1974. A preliminary Rb/Sr geochronological study of the Hardangervidda-Ryfylke nappe system in the Røldal area, south Norway. Norsk geologisk tidsskrift 54, 35-47.
- Annen, C., Blundy, J.D., Sparks, R.S.J., 2006. The Genesis of Intermediate and Silicic Magmas in Deep Crustal Hot Zones. Journal of Petrology 47, 505-539.
- Appleby, S.K., Gillespie, M.R., Graham, C.M., Hinton, R.W., Oliver, G.J.H., Kelly, N.M., 2009. Do Stype granites commonly sample infracrustal sources? New results from an integrated O, U-Pb and Hf isotope study of zircon. Contributions to Mineralogy and Petrology, 1-18.
- Appleby, S.K., Graham, C.M., Gillespie, M.R., Hinton, R.W., Oliver, G.J.H., EIMF, 2008. A cryptic record of magma mixing in diorites revealed by high-precision SIMS oxygen isotope analysis of zircons. Earth and Planetary Science Letters 269, 105-117.
- Armstrong, R.L., 1968. A model for the evolution of strontium and lead isotopes in a dynamic Earth Reviews in Geophysics 6, 175-199.
- Armstrong, R.L., 1971. Isotopic and chemical constraints on models of magma genesis in volcanic arcs. Earth & Planetary Science Letters 12, 137-142.
- Armstrong, R.L., 1981. Radiogenic isotopes: The case for crustal recycling on a near-steady-state nocontinental-growth Earth. Philosophical Transactions of the Royal Society of London 301, 443-472.
- Arndt, N.T., Goldstein, S.L., 1989. An open boundary between lower continental crust and mantle: its role in crust formation and crustal recycling. Tectonophysics 161, 201-212.
- Austin-Hegardt, E., Claesson, L., Cornell, D., Simakov, S.K., 2004. Eclogites in the central part of the Sveconorwegian Eastern Segment of the Baltic Shield: support for a Subduction-Extrusion model. GFF 126, 17.
- Austin-Hegardt, E., Cornell, D.H., Hellström, F.A., Lundqvist, I., 2007. Emplacement ages of the mid-Proterozoic Kungsbacka bimodal suite, SW Sweden. GFF 129, 227-234.
- Austrheim, H., Corfu, F., 2009. Formation of planar deformation features (PDFs) in zircon during coseismic faulting and an evaluation of potential effects on U-Pb systematics. Chemical Geology 261, 24-30.
- Austrheim, H., Corfu, F., Bryhni, I., Andersen, T.B., 2003. The Proterozoic Hustad igneous complex: A low strain enclave with a key to the history of the Western Gneiss Region of Norway. Precambrian Research 120, 149-175.
- Bahlburg, H., Vervoort, J.D., Du Frane, S.A., Bock, B., Augustsson, C., Reimann, C., 2009. Timing of crust formation and recycling in accretionary orogens: Insights learned from the western margin of South America. Earth Science Reviews 97, 227-253.
- Baitis, H.W., Lindstrom, M.M., 1980. Geology, petrography, and petrology of Pinzon Island, Galapagos Archipelago. Contributions to Mineralogy and Petrology 72, 367-386.

- Baker, M.B., Grove, T.L., Price, R., 1994. Primitive basalts and andesites from the Mt. Shasta region, N. California: products of varying melt fraction and water content. Contributions to Mineralogy and Petrology 118, 111-129.
- Barbarin, B., 1999. A review of the relationships between granitoid types, their origins and their geodynamic environments. Lithos 46, 605-626.
- Barry, T.L., Pearce, J.A., Leat, P.T., Millar, I.L., le Roex, A.P., 2006. Hf isotope evidence for selective mobility of high-field-strength elements in a subduction setting: South Sandwich Islands. Earth and Planetary Science Letters 252, 223-244.
- Be'eri-Shlevin, Y., Katzir, Y., Valley, J.W., 2009. Crustal evolution and recycling in a juvenile continent: Oxygen isotope ratio of zircon in the northern Arabian Nubian Shield. Lithos 107, 169-184.
- Begg, G., Belousova, E., Griffin, W.L., O'Reilly, S.Y., Natapov, L., 2009. Continental versus crustal growth: Resolving the paradox. Geochimica et Cosmochimica Acta 73, Supplement 1, A103.
- Behn, M.D., Kelemen, P.B., 2006. Stability of arc lower crust: Insights from the Talkeetna arc section, south central Alaska, and the seismic structure of modern arcs. Journal of Geophysical Research B: Solid Earth 111, 1-20.
- Belousova, E.A., Reid, A.J., Griffin, W.L., O'Reilly, S.Y., 2009. Rejuvenation vs. recycling of Archean crust in the Gawler Craton, South Australia: Evidence from U-Pb and Hf isotopes in detrital zircon. Lithos 113, 570-582.
- Berthelsen, A., 1980. Towards a palinspastic tectonic analysis of the Baltic Shield. In Cogné, J.& Slansky, M.(eds.), Geology of Europe, from Precambrian to the post-Hercynian sedimentary basins 108, 5-21.
- Betts, P.G., Giles, D., 2006. The 1800-1100 Ma tectonic evolution of Australia. Precambrian Research 144, 92-125.
- Betts, P.G., Giles, D., Schaefer, B.F., 2008. Comparing 1800-1600 Ma accretionary and basin processes in Australia and Laurentia: Possible geographic connections in Columbia. Precambrian Research 166, 81-92.
- Betts, P.G., Giles, D., Schaefer, B.F., Mark, G., 2007. 1600-1500 Ma hotspot track in eastern Australia: Implications for Mesoproterozoic continental reconstructions. Terra Nova 19, 496-501.
- Bindeman, I.N., Eiler, J.M., Yogodzinski, G.M., Tatsumi, Y., Stern, C.R., Grove, T.L., Portnyagin, M., Hoernle, K., Danyushevsky, L.V., 2005. Oxygen isotope evidence for slab melting in modern and ancient subduction zones. Earth and Planetary Science Letters 235, 480-496.
- Bindeman, I.N., Ponomareva, V.V., Bailey, J.C., Valley, J.W., 2004. Volcanic arc of Kamchatka: A province with high-δ<sup>18</sup>O magma sources and large-scale <sup>18</sup>O/<sup>16</sup>O depletion of the upper crust. Geochimica et Cosmochimica Acta 68, 841-865.
- Bingen, B., Andersson, J., Söderlund, U., Möller, C., 2008a. The Mesoproterozoic in the Nordic countries. Episodes 31, 29-34.
- Bingen, B., Austrheim, H., Whitehouse, M., 2001a. Ilmenite as a source for zirconium during high-grade metamorphism? textural evidence from the caledonides of Western Norway and implications for zircon geochronology. Journal of Petrology 42, 355-375.
- Bingen, B., Birkeland, A., Nordgulen, Ø., Sigmond, E.M.O., 2001b. Correlation of supracrustal sequences and origin of terranes in the Sveconorwegian orogen of SW Scandinavia: SIMS data on zircon in clastic metasediments. Precambrian Research 108, 293-318.

- Bingen, B., Davis, W.J., Hamilton, M.A., Engvik, A.K., Stein, H.J., Skår, Ø., Nordgulen, Ø., 2008b. Geochronology of high-grade metamorphism in the Sveconorwegian belt, S. Norway: U-Pb, Th-Pb and Re-Os data. Norsk Geologisk Tidsskrift 88, 13-42.
- Bingen, B., Demaiffe, D., Hertogen, J., Weis, D., Michot, J., 1993. K-rich calc-alkaline augen gneisses of Grenvillian age in southern Norway: mingling of mantle-derived and crustal components. Journal of Geology 101, 763-778.
- Bingen, B., Griffin, W.L., Torsvik, T.H., Saeed, A., 2005a. Timing of Late Neoproterozoic glaciation in Baltica constrained by detrital zircon geochronology in the Hedmark Group, south-east Norway. Terra Nova 17, 250-258.
- Bingen, B., Mansfeld, J., Sigmond, E.M.O., Stein, H.J., 2002. Baltica-Laurentia link during the Mesoproterzoic: 1.27 Ga development of continental basins in the Sveconorwegian Orogen, southern Norway. Canadian Journal of Earth Sciences 39, 1425-1440.
- Bingen, B., Nordgulen, Ø., Sigmond, E.M.O., Tucker, R., Mansfeld, J., Högdahl, K., 2003. Relations between 1.19-1.13 Ga continental magmatism, sedimentation and metamorphism, Sveconorwegian province, S Norway. Precambrian Research 124, 215-241.
- Bingen, B., Nordgulen, Ø., Viola, G., 2008c. A four-phase model for the Sveconorwegian orogeny, SW Scandinavia. Norsk Geologisk Tidsskrift 88, 43-72.
- Bingen, B., Skår, Ø., Marker, M., Sigmond, E.M.O., Nordgulen, Ø., Ragnhildstveit, J., Mansfeld, J., Tucker, R.D., Liégeois, J.-P., 2005b. Timing of continental building in the Sveconorwegian orogen, SW Scandinavia. Norsk Geologisk Tidsskrift 85, 87-105.
- Bingen, B., Solli, A., 2009. Geochronology of magmatism in the Caledonian and Sveconorwegian belts of Baltica: Synopsis for detrital zircon provenance studies. Norsk Geologisk Tidsskrift 89, 267-290.
- Bingen, B., Stein, H.J., 2003. Molybdenite Re-Os dating of biotite dehydration melting in the Rogaland high-temperature granulites, S. Norway. Earth and Planetary Science Letters 208, 181-195.
- Bingen, B., Stein, H.J., Bogaerts, M., Bolle, O., Mansfeld, J., 2006. Molybdenite Re-Os dating constrains gravitational collapse of the Sveconorwegian orogen, SW Scandinavia. Lithos 87, 328-346.
- Bingen, B., Van Breemen, O., 1998. Tectonic regimes and terrane bondaries in the high-grade Sveconorwegian belt of SW Norway, inferred from U-Pb zircon geochronology and geochemical signature of augen gneiss suites. Journal of the Geological Society, London 155, 143-154.
- Birkeland, A., Sigmond, E.M.O., Whitehouse, M.J., Vestin, J., 1997. From Archaean to Proterozoic on Hardangervidda, South Norway. NGU Bulletin 433, 4-5.
- Bispo-Santos, F., D'Agrella-Filho, M.S., Pacca, I.I.G., Janikian, L., Trindade, R.I.F., Elming, S.-A., Silva, J.A., Barros, M.A.S., Pinho, F.E.C., 2008. Columbia revisited: Paleomagnetic results from the 1790 Ma colider volcanics (SW Amazonian Craton, Brazil). Precambrian Research 164, 40-49.
- Bleeker, W., 2003. The late Archean record: A puzzle in ca. 35 pieces. Lithos 71, 99-134.
- Bleiner, D., Günther, D., 2001. Theoretical description and experimental observation of aerosol transport processes in laser ablation inductively coupled plasma mass spectrometry. Journal of Analytical Atomic Spectrometry 16, 449-456.
- Bogaerts, M., Scaillet, B., Vander Auwera, J., 2006. Phase equilibria of the Lyngdal granodiorite (Norway): Implications for the origin of metaluminous ferroan granitoids. Journal of Petrology 47, 2405-2431.

- Bogaerts, M., Scaillet, B., Liegeois, J.-P., Vander Auwera, J., 2003. Petrology and geochemistry of the Lyngdal granodiorite (Southern Norway) and the role of fractional crystallisation in the genesis of Proterozoic ferro-potassic A-type granites. Precambrian Research 124, 149-184.
- Bogdanova, S.V., Bingen, B., Gorbatschev, R., Kheraskova, T.N., Kozlov, V.I., Puchkov, V.N., Volozh, Y.A., 2008. The East European Craton (Baltica) before and during the assembly of Rodinia. Precambrian Research 160, 23-45.
- Bogdanova, S.V., Page, L.M., Skridlaite, G., Taran, L.N., 2001. Proterozoic tectonothermal history in the western part of the East European Craton: <sup>40</sup>Ar/<sup>39</sup>Ar geochronological constraints. Tectonophysics 339, 39-66.
- Bolle, O., Demaiffe, D., Duchesne, J.-C., 2003a. Petrogenesis of jotunitic and acidic members of an AMC suite (Rogaland anorthosite province, SW Norway): a Sr and Nd isotopic assessment. Precambrian Research 124, 185.
- Bolle, O., Diot, H., Trindade, R.I.F., 2003b. Magnetic fabrics in the Holum granite (Vest-Agder, southernmost Norway): implications for the late evolution of the Sveconorwgeian (Grenvillian) orogen of SW Scandinavia. Precambrian Research 121, 221-249.
- Bonin, B., 2007. A-type granites and related rocks: Evolution of a concept, problems and prospects. Lithos 97, 1-29.
- Botcharnikov, R.E., Almeev, R.R., Koepke, J., Holtz, F., 2008. Phase relations and liquid lines of descent in hydrous ferrobasalt - Implications for the Skaergaard intrusion and Columbia river flood basalts. Journal of Petrology 49, 1687-1727.
- Bouvier, A., Vervoort, J.D., Patchett, P.J., 2008. The Lu-Hf and Sm-Nd isotopic composition of CHUR: Constraints from unequilibrated chondrites and implications for the bulk composition of terrestrial planets. Earth and Planetary Science Letters 273, 48-57.
- Bowen, N.L., 1928. The Evolution of the Igneous Rocks. Princeton University Press, Princeton, New Jersey.
- Brander, L., Söderlund, U., 2009. Mesoproterozoic (1.47-1.44 Ga) orogenic magmatism in Fennoscandia; Baddeleyite U-Pb dating of a suite of massif-type anorthosite in S. Sweden. International Journal of Earth Science 98, 499-516.
- Brenan, J.M., Shaw, H.F., Phinney, D.L., Ryerson, F.J., 1994. Rutile-aqueous fluid partitioning of Nb, Ta, Hf, Zr, U and Th: implications for high field strength element depletions in island-arc basalts. Earth and Planetary Science Letters 128, 327-339.
- Brewer, T.S., 1985. Geochemistry, geochronology and tectonic setting of the Proterozoic Telemark supracrustals, southern Norway. Unpublished PhD thesis, Nottingham University.
- Brewer, T.S., Åhäll, K.-I., Darbyshire, D.P.F., Menuge, J.F., 2002. Geochemistry of late Mesoproterozoic volcanism in southwestern Scandinavia: implications for Sveconorwegian/Grenvillian plate tectonics models. Journal of the Geological Society, London 159, 129-144.
- Brewer, T.S., Åhäll, K.-I., Menuge, J.F., Storey, C.D., Parrish, R.R., 2004. Mesoproterozoic bimodal volcanism in SW Norway, evidence for recurring pr-Sveconorwegian continental margin tectonism. Precambrian Research 134, 249-273.
- Brewer, T.S., Daly, J.S., Åhäll, K.-I., 1998. Contrasting magmatic arcs in the Palaeoproterozoic of the south-western Baltic Shield. Precambrian Research 92, 297-315.
- Brophy, J.G., 2008. A study of rare earth element (REE)-SiO<sub>2</sub> variations in felsic liquids generated by basalt fractionation and amphibolite melting: A potential test for discriminating between the two different processes. Contributions to Mineralogy and Petrology 156, 337-357.

- Brown, M., 1994. The generation, segregation, ascent and emplacement of granite magma: the migmatiteto-crustally-derived granite connection in thickened orogens. Earth Science Reviews 36, 83-130.
- Buchan, K.L., Mertanen, S., Park, R.G., Pesonen, L.J., Elming, S.-Å., Abrahamsen, N., Bylund, G., 2000. Comparing the drift of Laurentia and Baltica in the Proterozoic: the importance of key palaeomagnetic poles. Tectonophysics 319, 167-198.
- Burton, K.W., Kohn, M.J., Cohen, A.S., O'Nions, K. R., 1995. The relative diffusion of Pb, Nd, Sr and O in garnet. Earth Planetary. Science Letters 133 (1-2), 199-211.
- Campbell, I.H., Allen, C.M., 2008. Formation of supercontinents linked to increases in atmospheric oxygen. Nature Geoscience 1, 554-558.
- Carmichael, I.S.E., 1964. The petrology of Thingmuli, a Tertiary volcano in eastern Iceland. Journal of Petrology 5, 435-460.
- Carmichael, I.S.E., Ghiorso, M.S., 1990. Controls on oxidation-reduction relations in magmas. Reviews in Mineralogy and Geochemistry 24, 191-212.
- Carr, S.D., Easton, R.M., Jamieson, R.A., Culshaw, N.G., 2000. Geologic transect across the Grenville orogen of Ontario and New York. Canadian Journal of Earth Sciences 37, 193-216.
- Cawood, P.A., Kröner, A., Collins, W.J., Kusky, T.M., Mooney, W.D., Windley, B.F., 2009. Accretionary orogens through Earth history. In: Cawood, P.A. & Kröner, A. (eds.) Earth Accretionary Systems in Space and Time, Geological Society of London, Special Publication 318, 1-36.
- Cawood, P.A., Nemchin, A.A., Strachan, R., Prave, T., Krabbendam, M., 2007. Sedimentary basin and detrital zircon record along East Laurentia and Baltica during assembly and breakup of Rodinia. Journal of the Geological Society 164, 257-275.
- Cawood, P.A., Nemchin, A.A., Strachan, R.A., Kinny, P.D., Loewy, S., 2004. Laurentian provenance and an intracratonic tectonic setting for the Moine Supergroup, Scotland, constrained by detrital zircons from the Loch Eil and Glen Urquhart successions. Journal of the Geological Society 161, 861-874.
- Cawood, P.A., Strachan, R., Cutts, K., Kinny, P.D., Hand, M., Pisarevsky, S., 2010. Neoproterozoic orogeny along the margin of Rodinia: Valhalla orogen, North Atlantic. Geology 38, 99-102.
- Chadwick, B., Garde, A.A., 1996. Palaeoproterozoic oblique plate convergence in South Greenland: a reappraisal of the Ketilidian Orogen. In: Brewer, T.S. (Ed.), Precambrian Crustal Evolution in the North Atlantic Region. Geological Society of London, Special Publications 112, 179-196.
- Chappell, B.W., White, A.J.R., 1974. Two contrasting granite types. Pacific Geology 8, 173-174.
- Christiansen, E.H., McCurry, M., 2008. Contrasting origins of Cenozoic silicic volcanic rocks from the western Cordillera of the United States. Bulletin of Volcanology 70, 251-267.
- Christoffel, C.A., Connelly, J.N., Åhäll, K., 1999. Timing and characterisation of recurrent pre-Sveconorwegian metamorphism and deformation in the Varberg-Halmstad region of SW Sweden. Precambrian Research 98, 173-195.
- Claesson, S., 1987. Isotopic evidence for the Precambrian provenance and Caledonian metamorphism of high grade paragneisses from the Seve Nappes, Scandinavian Caledonides - I. Conventional U-Pb zircon and Sm-Nd whole rock data. Contributions to Mineralogy and Petrology 97, 196-204.
- Clemens, J.D., Holloway, J.R., White, A.J.R., 1986. Origin of an A-type granite: experimental constraints. American Mineralogist 71, 317-324.

- Clift, P.D., Draut, A.E., Kelemen, P.B., Blusztajn, J., Greene, A., 2005. Stratigraphic and geochemical evolution of an oceanic arc upper crustal section: The Jurassic Talkeetna Volcanic Formation, south-central Alaska. Bulletin of the Geological Society of America 117, 902-925.
- Clift, P.D., Schouten, H., Vannucchi, P., 2009. Arc-continent collisions, sediment recycling and the maintenance of the continental crust. In: Cawood, P.A. & Kröner, A. (eds.) Earth Accretionary Systems in Space and Time, Geological Society of London, Special Publication 318, 75-103.
- Collins, W.J., 2002. Hot orogens, tectonic switching, and creation of continental crust. Geology 30, 535-538.
- Collins, W.J., Beams, S.D., White, A.J.R., Chappell, B.W., 1982. Nature and origin of A-type granites with particular reference to southeastern Australia. Contributions to Mineralogy and Petrology 80, 189-200.
- Condie, K.C., 2002. Continental growth during a 1.9-Ga superplume event. Journal of Geodynamics 34, 249-264.
- Condie, K.C., 1998. Episodic continental growth and supercontinents: a mantle avalanche connection? Earth and Planetary Science Letters 163, 97-108.
- Condie, K.C., 2005. Earth as an Evolving Planetary System. Elsevier, Amsterdam, 1-350.
- Condie, K.C., 2004. Supercontinents and superplume events: distinguishing signals in the geologic record. Physics of the Earth and Planetary Interiors 146, 319-332.
- Condie, K.C., Belousova, E., Griffin, W.L., Sircombe, K.N., 2009. Granitoid events in space and time: Constraints from igneous and detrital zircon age spectra. Gondwana Research 15, 228-242.
- Connelly, J.N., Åhäll, K., 1996. The Mesoproterozoic cratonization of Baltica new age constraints from SW Sweden. In: Brewer, T.S. (Ed.), Precambrian Crustal Evolution in the North Atlantic Region. Geological Society of London, Special Publications 112, 261-273.
- Connelly, J.N., Berglund, J., Larson, S.Å., 1996. Thermotectonic evolution of the Eastern Segment of southwestern Sweden: tectonic constraints from U-Pb geochronology. In: Brewer, T.S. (Ed.), Precambrian Crustal Evolution in the North Atlantic Region. Geological Society of London, Special Publications 112, 297-313.
- Cordani, U.G., Teixeira, W., D'Agrella-Filho, M.S., Trindade, R.I., 2009. The position of the Amazonian Craton in supercontinents. Gondwana Research 15, 396-407.
- Corfu, F., 2007. Multistage metamorphic evolution and nature of the amphibolite-granulite facies transition in Lofoten-Vesterålen, Norway, revealed by U-Pb in accessory minerals. Chemical Geology 241, 108-128.
- Corfu, F., 2004. U-Pb age, setting and tectonic significance of the anorthosite-mangerite-charnockitegranite suite, Lofoten-Vesterålen, Norway. Journal of Petrology 45, 1799-1819.
- Corfu, F., 1980. U-Pb and Rb-Sr systematics in a polyorogenic segment of the Precambrian shield, central southern Norway. Lithos 13, 305-323.
- Corfu, F., Andersen, T.B., 2002. U-Pb ages of the Dalsfjord complex, SW Norway, and their bearing on the correlation of allochthonous crystalline segments of the Scandinavian Caledonides. International Journal of Earth Science 91, 955-963.
- Corfu, F., Armitage, P.E.B., Kullerud, K., Bergh, S.G., 2003. Preliminary U-Pb geochronology in the West Troms Basement Complex, North Norway: Archaean and Palaeoproterozoic events and younger overprints. Norges Geologiske Undersøkelse Bulletin 441, 61-72.

- Corfu, F., Emmett, T., 1992. U-Pb age of the Leirungsmyran gabbroic complex, Jotun Nappe, southern Norway. Norsk Geologisk Tidsskrift 72, 369-374.
- Corfu, F., Laajoki, K., 2008. An uncommon episode of mafic magmatism at 1347 Ma in the Mesoproterozoic Telemark supracrustals, Sveconorwegian orogen-Implications for stratigraphy and tectonic evolution. Precambrian Research 160, 299-307.
- Corfu, F., Roberts, R.J., Torsvik, T.H., Ashwal, L.D., Ramsay, D.M., 2007. Peri-Gondwanan elements in the Caledonian Nappes of Finnmark, Northern Norway: Implications for the paleogeographic framework of the Scandinavian Caledonides. American Journal of Science 307, 434-458.
- Cornell, D.H., Austin-Hegardt, E., 2004. When, where and how did the Sveconorwegian Terranes of Sweden meet? GFF 126, 20.
- Creaser, R.A., Price, R.C., Wormald, R.J., 1991. A-type granites revisited: assessment of a residualsource model. Geology 19, 163-166.
- Crowley, J.L., Schoene, B., Bowring, S.A., 2007. U-Pb dating of zircon in the Bishop Tuff at the millennial scale. Geology 35, 1123-1126.
- Dahlgren, S., Heaman, L., Krogh, T., 1990. Geological evolution and U-Pb geochronology of the Proterozoic central Telemark area, Norway. Geonytt 17, 38-39.
- Dall'Agnol, R., de Oliveira, D.C., 2007. Oxidized, magnetite-series, rapakivi-type granites of Carajás, Brazil: Implications for classification and petrogenesis of A-type granites. Lithos 93, 215-233.
- Dall'Agnol, R., Rämö, O.T., De Magalhães, M.S., Macambira, M.J.B., 1999. Petrology of the anorogenic, oxidised Jamon and Musa granites, Amazonian Craton: Implications for the genesis of Proterozoic A-type granites. Lithos 46, 431-462.
- Dalziel, I.W.D., 1991. Pacific margins of Laurentia and East Antarctica-Australia as a conjugate rift pair: evidence and implications for an Eocambrian supercontinent. Geology 19, 598-601.
- Davidson, J., 1985. Mechanisms of contamination in Lesser Antilles island arc magmas from radiogenic and oxygen isotope relationships. Earth and Planetary Science Letters 72, 163-174.
- de Haas, G.J.L.M., Andersen, T., Vestin, J., 1999. Detrital zircon geochronology: new evidence for an old model for accretion of the SW Baltic Shield. Journal of Geology 107, 569-586.
- de Haas, G.J.L.M., Nijland, T.G., Andersen, T., Corfu, F., 2002. New constraints on the timing of deposition and metamorphism in the Bamble sector, south Norway: zircon and titanite U-Pb data from the Nelaug area. GFF 124, 73-78.
- Deering, C.D., Gravley, D.M., Vogel, T.A., Cole, J.W., Leonard, G.S., 2010. Origins of cold-wetoxidizing to hot-dry-reducing rhyolite magma cycles and distribution in the Taupo Volcanic Zone, New Zealand. Contributions to Mineralogy and Petrology, 1-21.
- Defant, M.J., Drummond, M.S., 1990. Derivation of some modern arc magmas by melting of young subducted lithosphere. Nature 347, 662-665.
- Dickin, A.P., Higgins, M.D., 1992. Sm/Nd evidence for a major 1.5 Ga crust-forming event in the central Grenville Province. Geology 20, 137-140.
- Dostal, J., Dupuy, C., Carron, J.P., Le Guen de Kerneizon, M., Maury, R.C., 1983. Partition coefficients of trace elements: Application to volcanic rocks of St. Vincent, West Indies. Geochimica et Cosmochimica Acta 47, 525-533.
- Duchesne, J.-C., Liégeois, J.-P., Vander Auwera, J., Longhi, J., 1999. The crustal tongue melting model and the origin of massive anorthosites. Terra Nova 11, 100-105.

- Emslie, R.F., 1985. Proterozoic anorthosite massifs. In Tobi, A.C., Touret, J.L.R.(eds.), The Deep Proterozoic Crust in the North Atlantic Provinces, NATO Advanced Study Institute Series, 39-60.
- Ernst, R.E., Buchan, K.L., 2002. Maximum size and distribution in time and space of mantle plumes: Evidence from large igneous provinces. Journal of Geodynamics 34, 309-342.
- Ernst, R.E., Wingate, M.T.D., Buchan, K.L., Li, Z.X., 2008. Global record of 1600-700 Ma Large Igneous Provinces (LIPs): Implications for the reconstruction of the proposed Nuna (Columbia) and Rodinia supercontinents. Precambrian Research 160, 159-178.
- Evans, D.A.D., 2009. The palaeomagnetically viable, long-lived and all-inclusive Rodinia supercontinent reconstruction. In Murphy, J.B., Keppie, J.D. & Hynes, A.J. (Eds.) Ancient Orogens and Modern Analogues. Geological Society of London, Special Publication 327, 371-404.
- Ewart, A., Marsh, J.S., Milner, S.C., Duncan, A.R., Kamber, B.S., Armstrong, R.A., 2004. Petrology and geochemistry of early cretaceous bimodal continental flood volcanism of the NW Etendeka, Namibia. part 1: Introduction, mafic lavas and re-evaluation of mantle source components. Journal of Petrology 45, 59-105.
- Feig, S.T., Koepke, J., Snow, J.E., 2006. Effect of water on tholeiitic basalt phase equilibria: An experimental study under oxidizing conditions. Contributions to Mineralogy and Petrology 152, 611-638.
- Fitton, J.G., Saunders, A.D., Norry, M.J., Hardarson, B.S., Taylor, R.N., 1997. Thermal and chemical structure of the Iceland plume. Earth and Planetary Science Letters 153, 197-208.
- Flem, B., Grimstvedt, A., Slagstad, T., Skår, Ø., 2005. Bulkanalyse av Th og U I bergartsprøver med LA-ICP-MS. Metodebeskrivelse. NGU Rapport NGU, 2005-031, ISSN 0800-3416.
- Fossen, H., Hurich, C.A., 2005. The Hardangerfjord Shear Zone in SW Norway and the North Sea: A large-scale low-angle shear zone in the Caledonian crust. Journal of the Geological Society 162, 675-687.
- Foster, D.A., Gray, D.R., Spaggiari, C., Kamenov, G., Bierlein, F.P., 2009. Palaeozoic Lachlan orogen, Australia; accretion and construction of continental crust in a marginal ocean setting: Isotopic evidence from Cambrian metavolcanic rocks. In: Cawood, P.A. & Kröner, A. (eds.) Earth Accretionary Systems in Space and Time, Geological Society of London, Special Publication 318, 329-349.
- Frost, B.R., Barnes, C.G., Collins, W.J., Arculus, R.J., Ellis, D.J., Frost, C.D., 2001. A Geochemical Classification for Granitic Rocks. Journal of Petrology 42, 2033-2048.
- Frost, C.D., Frost, B.R., 1997. Reduced rapakivi-type granites: The tholeiite connection. Geology 25, 647-650.
- Frost, C.D., Frost, B.R., Chamberlain, K.R., Edwards, B.R., 1999. Petrogenesis of the 1.43 Ga Sherman batholith, SE Wyoming, USA: A reduced, rapakivi-type anorogenic granite. Journal of Petrology 40, 1771-1802.
- Fujimaki, H., Tatsumoto, M., Aoki, K., 1984. Partition coefficients of Hf, Zr, and REE between phenocrysts and groundmasses. Journal of Geophysical Research 89, 662-672.
- Fujinawa, A., 1988. Tholeiitic and calc-alkaline magma series at Adatara volcano, northeast Japan: 1. Geochemical constraints on their origin. Lithos 22, 135-158.
- Gaál, G., Gorbatschev, R., 1987. An Outline of the Precambrian evolution of the Baltic Shield. Precambrian Research 35, 15-52.
- Gabrielsen, R.H., 1980. The Precambrian Dyrskard group of the Hardangervidda-Ryfylke nappe complex, Haukelisæter-Røldal area, southwestern Norway. Norges Geologiske Undersøkelse 355, 1-20.

- Gabrielsen, R.H., Naterstad, H., Rahein, A., 1979. A Rb-Sr study of a possible Precambrian thrust zone, Hardangervidda-Ryfylke Nappe complex, southwest Norway. Norsk Geologisk Tidsskrift 59, 253-263.
- Gabrielsen, R.H., Solheim, S., 1980. New radiometric data on the Revsegg Formation, Hardangervidda-Ryfylke nappe complex, southwest Norway. Norges Geologiske Undersøkelse 355, 21-26.
- Gaetani, G.A., Grove, T.L., 1998. The influence of water on melting of mantle peridotite. Contributions to Mineralogy and Petrology 131, 323-346.
- Gaetani, G.A., Grove, T.L., Bryan, W.B., 1993. The influence of water on the petrogenesis of subductionrelated igneous rocks. Nature 365, 332-334.
- Garde, A.A., Hamilton, M.A., Chadwick, B., Grocott, J., McCaffrey, K.J.W., 2002. The Ketilidian orogen of South Greenland: Geochronology, tectonics, magmatism, and fore-arc accretion during Palaeoproterozoic oblique convergence. Canadian Journal of Earth Sciences 39, 765-793.
- Gasparon, M., Hilton, D.R., Varne, R., 1994. Crustal contamination processes traced by helium isotopes: Examples from the Sunda arc, Indonesia. Earth and Planetary Science Letters 126, 15-22.
- Gastil, G., 1960. The distribution of mineral dates in time and space. American Journal of Science 258, 1-35.
- Gee, D.G., 1975. A tectonic model for the central part of the Scandinavian Caledonides. American Journal of Science 275, 468-515.
- Gee, D.G., Fossen, H., Henriksen, N., Higgins, A.K., 2008. From the early Paleozoic platforms of Baltica and Laurentia to the Caledonide Orogen of Scandinavia and Greenland. Episodes 31, 44-51.
- Geraldes, M.C., Van Schmus, W.R., Condie, K.C., Bell, S., Teixeira, W., Babinski, M., 2001. Proterozoic geologic evolution of the SW part of the Amazonian Craton in Mato Grosso state, Brazil. Precambrian Research 111, 91-128.
- Gerstenberger, H., Haase, G., 1997. A highly effective emitter substance for mass spectrometric Pb isotope ratio determinations. Chemical Geology 136, 309-312.
- Gibson, S.A., Thompson, R.N., Dickin, A.P., 2000. Ferropicrites: Geochemical evidence for Fe-rich streaks in upwelling mantle plumes. Earth and Planetary Science Letters 174, 355-374.
- Giles, D., Betts, P.G., Lister, G.S., 2004. 1.8-1.5-Ga links between the North and South Australian Cratons and the Early-Middle Proterozoic configuration of Australia. Tectonophysics 380, 27-41.
- Gill, J.B., 1981. Orogenic Andesites and Plate Tectonics. Springer-Verlag, New York, 1-390.
- Gower, C.F., 1996. The evolution of the Grenville Province in eastern Labrador, Canada. In Brewer, T.S.(ed.) Precambrian crustal evolution in the North Atlantic Regions. Geological Society of London, Special Publication 112, 197-218.
- Gower, C.F., 1985. Correlations between the Grenville province and Sveconorwegian orogenic belt implications for Proterozoic evolution of the southern margins of the Canadian and Baltic Shields. In Tobi, A.C., Touret, J.L.R.(eds.), The Deep Proterozoic Crust in the North Atlantic Provinces, NATO Advanced Study Institute Series, 247-257.
- Gower, C.F., Kamo, S.L., Kwok, K., Krogh, T.E., 2008. Proterozoic southward accretion and Grenvillian orogenesis in the interior Grenville Province in eastern Labrador: Evidence from U-Pb geochronological investigations. Precambrian Research 165, 61-95.
- Gower, C.F., Ryan, A.B., Rivers, T., 1990. Mid-Proterozoic Laurentia-Baltica: an overview of its geological evolution and a summary of the contributions made by this volume. In Gower, C.F.,

Rivers, T., Ryan, B.(eds.), Mid-Proterozoic Laurentia-Baltica, Geological Association of Canada, Special Paper 38, 1-20.

- Green, T.H., 1981. Experimental evidence for the role of accessory phases in magma genesis. Journal of Volcanology and Geothermal Research 10, 405-422.
- Greene, A.R., Debari, S.M., Kelemen, P.B., Blusztajn, J., Clift, P.D., 2006. A detailed geochemical study of island arc crust: The Talkeetna Arc section, south-central Alaska. Journal of Petrology 47, 1051-1093.
- Griffin, W.L., O'Reilly, S.Y., Afonso, J.C., Begg, G.C., 2009. The composition and evolution of lithospheric mantle: a re-evaluation and its tectonic implications. Journal of Petrology 50, 1185-1204.
- Griffin, W.L., Pearson, N.J., Belousova, E., Jackson, S.E., van Achterbergh, E., O'Reilly, S.Y., Shee, S.R., 2000. The Hf isotope composition of cratonic mantle: LAM-MC-ICPMS analysis of zircon megacrysts in kimberlites. Geochimica et Cosmochimica Acta 64, 133-147.
- Grove, T.L., Elkins-Tanton, L.T., Parman, S.W., Chatterjee, N., Müntener, O., Gaetani, G.A., 2003. Fractional crystallization and mantle-melting controls on calc-alkaline differentiation trends. Contributions to Mineralogy and Petrology 145, 515-533.
- Grove, T.L., Baker, M.B., 1984. Phase equilibrium controls on the tholeiitic versus calc-alkaline differentiation trends. Journal of Geophysical Research 89, 3253-3274.
- Haapala, I., Rämö, O.T., Frindt, S., 2005. Comparison of proterozoic and phanerozoic rift-related basaltic-granitic magmatism. Lithos 80, 1-32.
- Hageskov, B., 1997. Geochemistry and tectonic significance of late Gothian mafic dykes in the Østfold-Marstrand belt of SE Norway and W Sweden. Precambrian Research 82, 287-309.
- Hamada, M., Fujii, T., 2008. Experimental constraints on the effects of pressure and H<sub>2</sub>O on the fractional crystallization of high-Mg island arc basalt. Contributions to Mineralogy and Petrology 155, 767-790.
- Handke, M.J., Tucker, R.D., Robinson, P., 1995. Contrasting U-Pb Ages for the Risberget Augen Gneiss in the Norwegian Caledonides: Getting to the root of the problem. Geological Society of America Abstracts 27, A-226.
- Hargrove, U.S., Stern, R.J., Kimura, J.-I., Manton, W.I., Johnson, P.R., 2006. How juvenile is the Arabian–Nubian Shield? Evidence from Nd isotopes and pre-Neoproterozoic inherited zircon in the Bi'r Umq suture zone, Saudi Arabia. Earth and Planetary Science Letters 252, 308-326.
- Hawkesworth, C., Cawood, P., Kemp, T., Storey, C., Dhuime, B., 2009. Geochemistry: A matter of preservation. Science 323, 49-50.
- Hawkesworth, C.J., Dhuime, B., Pietranik, A.B., Cawood, P.A., Kemp, A.I.S., Storey, C.D., 2010. The generation and evolution of the continental crust. Journal of the Geological Society 167, 229-248.
- Hawkesworth, C.J., Kemp, A.I.S., 2006. Using hafnium and oxygen isotopes in zircons to unravel the record of crustal evolution. Chemical Geology 226, 144-162.
- Hawkesworth, C.J., O'Nions, R.K., Arculus, R.J., 1979. Nd and Sr isotope geochemistry of island arc volcanics, Grenada, Lesser Antilles. Earth and Planetary Science Letters 45, 237-248.
- He, Y., Zhao, G., Sun, M., Han, Y., 2010. Petrogenesis and tectonic setting of volcanic rocks in the Xiaoshan and Waifangshan areas along the southern margin of the North China Craton: Constraints from bulk-rock geochemistry and Sr-Nd isotopic composition. Lithos 114, 186-199.

- He, Y., Zhao, G., Sun, M., Wilde, S.A., 2008. Geochemistry, isotope systematics and petrogenesis of the volcanic rocks in the Zhongtiao Mountain: An alternative interpretation for the evolution of the southern margin of the North China Craton. Lithos 102, 158-178.
- Hildreth, W., Moorbath, S., 1988. Crustal contributions to arc magmatism in the Andes of Central Chile. Contributions to Mineralogy and Petrology 98, 455-489.
- Hill, B.M., Bickford, M.E., 2001. Paleoproterozoic rocks of central Colorado: Accreted arcs or extended older crust? Geology 29, 1015-1018.
- Hirata, T., 1997. Soft ablation technique for laser ablation-inductively coupled plasma mass spectrometry. Journal of Analytical Atomic Spectrometry 12, 1337-1342.
- Hirata, T., Nesbitt, R.W., 1995. U-Pb isotope geochronology of zircon: evaluation of the laser probeinductively coupled plasma mass spectrometry technique. Geochimica et Cosmochimica Acta 59, 2491-2500.
- Hoffman, P.F., 1997. Tectonic genealogy of North America. In: van der Pluijm, B.A., Marshak, S., (eds.) Earth structure: An introduction to structural geology and tectonics, 459-464.
- Hoffman, P.F., 1988. United plates of America, the birth of a craton: Early Proterozoic assembly and growth of Laurentia. Annual review of Earth and Planetary Sciences 16, 543-603.
- Hoffman, P.F., 1991. Did the breakout of Laurentia turn Gondwanaland inside-out? Science 252, 1409-1412.
- Högdahl, K., Andersson, U.B., Eklund, O., 2004. The Transscandinavian Igneous Belt (TIB) in Sweden: A review of its character and evolution. Special Paper of the Geological Survey of Finland 37, 1-125.
- Hooper, P.R., 2000. Chemical discrimination of Columbia River basalt flows. Geochemisty Geophysics Geosystems 1 (6).
- Hora, J.M., Singer, B.S., Wörner, G., Beard, B.L., Jicha, B.R., Johnson, C.M., 2009. Shallow and deep crustal control on differentiation of calc-alkaline and tholeiitic magma. Earth and Planetary Science Letters 285, 75-86.
- Horn, I., Rudnick, R.L., McDonough, W.F., 2000. Precise elemental and isotope ratio determination by simultaneous solution nebulization and laser ablation-ICP-MS: application to U–Pb geochronology. Chemical Geology 164, 281-301.
- Horstwood, M.S.A., Foster, G.L., Parrish, R.R., Noble, S.R., Nowell, G.M., 2003. Common-Pb corrected in situ U-Pb accessory mineral geochronology by LA-MC-ICP-MS. Journal of Analytical Atomic Spectrometry 18, 837-846.
- Horstwood, M.S.A., Parrish, R.R., Condon, D.J., Pashley, V., 2006. Laser ablation acquisition protocols and non-matrix matched standardisation of U–Pb data. Geochimica et Cosmochimica Acta 70, Supplement 1, A264.
- Hou, G., Santosh, M., Qian, X., Lister, G.S., Li, J., 2008a. Configuration of the Late Paleoproterozoic supercontinent Columbia: Insights from radiating mafic dyke swarms. Gondwana Research 14, 395-409.
- Hou, G., Santosh, M., Qian, X., Lister, G.S., Li, J., 2008b. Tectonic constraints on 1.3~1.2 Ga final breakup of Columbia supercontinent from a giant radiating dyke swarm. Gondwana Research 14, 561-566.
- Hubbard, F.H., 1975. The Precambrian crystalline complex of SW Sweden. The geology and petrogenetic development of the Varberg Region. GFF 97, 223-236.

- Hunter, A.G., 1998. Intracrustal Controls on the Coexistence of Tholeiitic and Calc-alkaline Magma Series at Aso Volcano, SW Japan. Journal of Petrology 39, 1255-1284.
- Iizuka, T., Komiya, T., Rino, S., Maruyama, S., Hirata, T., 2010. Detrital zircon evidence for Hf isotopic evolution of granitoid crust and continental growth. Geochimica et Cosmochimica Acta 74, 2450-2472.
- Irvine, T.N., Baragar, W.R.A., 1971. A guide to the chemical classification of the common volcanic rocks. Canadian Journal of Earth Sciences 8, 523-548.
- Jackson, S.E., Pearson, N.J., Griffin, W.L., Belousova, E.A., 2004. The application of laser ablationinductively coupled plasma-mass spectrometry to in situ U–Pb zircon geochronology. Chemical Geology 211, 47-69.
- James, D.E., 1981. The combined use of oxygen and radiogenic isotopes as indicators of crustal contamination. Annual Reviews in Earth and Planetary Science 15, 395-396.
- Johansson, Å., 1990. Age of the Önnestad syenite and some gneissic granites along the southern part of the Protogine Zone, southern Sweden. In Gower, C.F., Rivers, T., Ryan, B.(eds.), Mid-Proterozoic Laurentia-Baltica, Geological Association of Canada, Special Paper 38, 131-148.
- Johansson, Å., 2009. Baltica, Amazonia and the SAMBA connection-1000 million years of neighbourhood during the Proterozoic? Precambrian Research 175, 221-234.
- Johansson, L., Schöberg, H., Solyom, Z., 1993. The age and regional correlation of the Svecofennian Geitfjell granite, Vestranden, Norway. Norsk Geologisk Tidsskrift 73, 133-143.
- Karlstrom, K.E., Åhäll, K.-I., Harlan, S.S., Williams, M.L., McLelland, J., Geissman, J.W., 2001. Longlived (1.8-1.0 Ga) convergent orogen in southern Laurentia, its extensions to Australia and Baltica, and implications for refining Rodinia. Precambrian Research 111, 5-30.
- Karlstrom, K.E., Harlan, S.S., Williams, M.L., McLelland, J., Geissman, J.W., Åhäll, K.-I., 1999. Refining Rodinia: Geologic evidence for the Australia-Western U.S. Connection in the Proterozoic. GSA Today 9, 2-7.
- Kawamoto, T., 1996. Experimental constraints on differentiation and H<sub>2</sub>O abundance of calc-alkaline magmas. Earth and Planetary Science Letters 144 , 577-589.
- Kay, S.M., Kay, R.W., 1985. Role of crystal cumulates and the oceanic crust in the formation of the lower crust of the Aleutian arc. Geology 13, 461-464.
- Kay, S.M., Kay, R.W., Citron, G.P., 1982. Tectonic controls on tholeiitic and calc-alkaline magmatism in the Aleutian Arc. Journal of Geophysical Research 87, 4051-4072.
- Kelemen, P.B., Shimizu, N., Dunn, T., 1993. Relative depletion of niobium in some arc magmas and the continental crust: partitioning of K, Nb, La and Ce during melt/rock reaction in the upper mantle. Earth and Planetary Science Letters 120, 111-134.
- Kemp, A.I.S., Hawkesworth, C.J., Collins, W.J., Gray, C.M., Blevin, P.L., 2009. Isotopic evidence for rapid continental growth in an extensional accretionary orogen: The Tasmanides, eastern Australia. Earth and Planetary Science Letters 284, 455-466.
- Kemp, A.I.S., Hawkesworth, C.J., Foster, G.L., Paterson, B.A., Woodhead, J.D., Hergt, J.M., Gray, C.M., Whitehouse, M.J., 2007. Magmatic and crustal differentiation history of granitic rocks from Hf-O isotopes in zircon. Science 315, 980-983.
- Kemp, A.I.S., Wormald, R.J., Whitehouse, M.J., Price, R.C., 2005. Hf isotopes in zircon reveal contrasting sources and crystallization histories for alkaline to peralkaline granites of Temora, southeastern Australia. Geology 33, 797-800.

- Kerr, A., Ryan, B., Gower, C.F., Wardle, R.J., 1996. The Makkovik Province: extension of the Ketilidian Mobile Belt in mainland North America. In: Brewer, T.S.(ed.) Precambrian crustal evolution in the North Atlantic Regions. Geological Society of London, Special Publication 112, 155-177.
- Ketchum, J.W.F., Jackson, S.E., Culshaw, N.G., Barr, S.M., 2001. Depositional and tectonic setting of the Paleoproterozoic Lower Aillik Group, Makkovik Province, Canada: Evolution of a passive margin-foredeep sequence based on petrochemistry and U-Pb (TIMS and LAM-ICP-MS) geochronology. Precambrian Research 105, 331-356.
- Kirkland, C.L., Daly, J.S., Whitehouse, M.J., 2008a. Basement-cover relationships of the Kalak Nappe Complex, Arctic Norwegian Caledonides and constraints on Neoproterozoic terrane assembly in the North Atlantic region. Precambrian Research 160, 245-276.
- Kirkland, C.L., Daly, J.S., Whitehouse, M.J., 2006. Granitic magmatism of grenvillian and late neoproterozoic age in Finnmark, Arctic Norway - Constraining pre-Scandian deformation in the Kalak Nappe Complex. Precambrian Research 145, 24-52.
- Kirkland, C.L., Daly, J.S., Whitehouse, M.J., 2007. Provenance and terrane evolution of the Kalak Nappe Complex, Norwegian Caledonides: Implications for neoproterozoic paleogeography and tectonics. Journal of Geology 115, 21-41.
- Kirkland, C.L., Strachan, R.A., Prave, A.R., 2008b. Detrital zircon signature of the Moine Supergroup, Scotland: Contrasts and comparisons with other Neoproterozoic successions within the circum-North Atlantic region. Precambrian Research 163, 332-350.
- Knudsen, T.-L., Andersen, T., 1999. Petrology and geochemistry of the Tromøy gneiss complex, South Norway, an alleged example of Proterozoic depleted lower continental crust. Journal of Petrology 40, 909-933.
- Knudsen, T.-L., Andersen, T., Whitehouse, M.J., Vestin, J., 1997. Detrital zircon ages from southern Norway - implications for the Proterozoic evolution of the southwestern Baltic Shield. Contributions to Mineralogy and Petrology 130, 47-58.
- Korja, A., Lahtinen, R., Nironen, M., 2006. The Svecofennian orogen: a collage of microcontinents and island arcs. In: Gee, D.G. and Stephenson, R.A. (Eds.), European Lithosphere Dynamics. Geological Society of London Memoirs 32, 561-578.
- Krogh, T.E., 1973. A low-contamination method for hydrothermal decomposition of zircon and extraction of U and Pb for isotopic age determinations. Geochimica et Cosmochimica Acta 37, 485-494.
- Krogh, T.E., 1982. Improved accuracy of U-Pb zircon ages by the creation of more concordant systems using an air abrasion technique. Geochimica et Cosmochimica Acta 46, 637-649.
- Kröner, A., Windley, B.F., Badarch, G., Tomurtogoo, O., Hegner, E., Jahn, B.M., Gruschka, S., Khain, E.V., Demoux, A., Wingate, M.T.D., 2007. Accretionary growth and crust formation in the Central Asian Orogenic Belt and comparison with the Arabian-Nubian shield. In: Hatcher, R.D., Carlson, M.P., McBride, J.J., & Martínez Catalán, J.R. (eds.) 4-D Framework of Continental Crust, Geological Society of America Memoir 200, 181-209.
- Kullerud, K., Skjerlie, K.P., Corfu, F., de la Rosa, J.D., 2006. The 2.40 Ga Ringvassøy mafic dykes, West Troms Basement Complex, Norway: The concluding act of early Palaeoproterozoic continental breakup. Precambrian Research 150, 183-200.
- Kuritani, T., Kitagawa, H., Nakamura, E., 2005. Assimilation and fractional crystallization controlled by transport process of crustal melt: Implications from an alkali basalt-dacite suite from Rishiri Volcano, Japan. Journal of Petrology 46 (7), 1421-1442.
- Kusky, T., Li, J., Santosh, M., 2007. The Paleoproterozoic North Hebei Orogen: North China craton's collisional suture with the Columbia supercontinent. Gondwana Research 12, 4-28.

- Kusky, T.M., Santosh, M., 2009. The Columbia connection in North China. In: Reddy, S.M., Mazumber, R., Evans, D.A.D. & Collins, A.S. (Eds.) Palaeoproterozoic Supercontinents and Global Evolution. Geological Society of London, Special Publication 323, 49-71.
- Laajoki, K., Corfu, F., 2007. Lithostratigraphy of the Mesoproterozoic Vemork formation, central Telemark, Norway. Bulletin of the Geological Society of Finland 79, 41-67.
- Laajoki, K., Corfu, F., Andersen, T., 2002. Lithostratigraphy and U-Pb geochronology of the Telemark supracrustals in the Bandak-Sauland area, Telemark, South Norway. Norsk Geologisk Tidsskrift 82, 119-138.
- Lackey, J.S., Valley, J.W., Saleeby, J.B., 2005. Supracrustal input to magmas in the deep crust of Sierra Nevada batholith: Evidence from high-δ<sup>18</sup>O zircon. Earth and Planetary Science Letters 235, 315-330.
- Ladenberger, A., Gee, D.G., Claesson, S., Majka, J., 2009. Interpreting Himalayan orogeny via the Paleozoic Scandian analogue. Geochimica et Cosmochimica Acta 73, Supplement 1, A714.
- Lahtinen, R., Korja, A., Nironen, M., Heikkinen, P., 2009. Palaeoproterozoic accretionary processes in Fennoscandia. In: Cawood, P.A. & Kröner, A. (eds.) Earth Accretionary Systems in Space and Time, Geological Society of London, Special Publication 318, 237-256.
- Landenberger, B., Collins, W.J., 1996. Derivation of A-type granites from a dehydrated charnockitic lower crust: Evidence from the Chaelundi Complex, Eastern Australia. Journal of Petrology 37, 145-170.
- Larsen, B.T., Olaussen, S., Sundvoll, B., Heeremans, M., 2008. The Permo-carboniferous Oslo rift through six stages and 65 million years. Episodes 31, 52-58.
- Larsen, Ø., Skår, Ø., Pedersen, R.-B., 2002. U-Pb zircon and titanite geochronological constraints on the late/post-Caledonian evolution of the Scandinavian Caledonides in north-central Norway. Norsk Geologisk Tidsskift 82, 1-13.
- Larson, S.Å., Berglund, J., Stigh, J., Tullborg, E.-L., 1990. The Protogine Zone, southwest Sweden: a new model - an old issue. In Gower, C.F., Rivers, T., Ryan, B.(eds.), Mid-Proterozoic Laurentia-Baltica, Geological Association of Canada, Special Paper 38, 317-333.
- Larson, S.Å., Cornell, D.H., Armstrong, R.A., 1999. Emplacement ages and metamorphic overprinting of granitoids in the Sveconorwegian Province in Varmland, Sweden - an ion probe study. Norsk Geologisk Tidsskrift 79, 97-96.
- Leeman, W.P., Vitaliano, C.J., Prinz, M., 1976. Evolved lavas from the Snake River Plain: Craters of the Moon National Monument, Idaho. Contributions to Mineralogy and Petrology 56, 35-60.
- Li, Z.-X., Bogdanova, S.V., Collins, A.S., Davidson, A., De Waele, B., Ernst, R.E., Fitzsimons, I.C.W., Fuck, R.A., Gladkochub, D.P., Jacobs, J., Karlstrom, K.E., Lu, S., Natapov, L.M., Pease, V., Pisarevsky, S.A., Thrane, K., Vernikovsky, V., 2008. Assembly, configuration, and break-up history of Rodinia: A synthesis. Precambrian Research 160, 179-210.
- Li, Z.-X., Zhong, S., 2009. Supercontinent-superplume coupling, true polar wander and plume mobility: Plate dominance in whole-mantle tectonics. Physics of the Earth and Planetary Interiors 176, 143-156.
- Liégeois, J.-P., Stern, R.J., 2010. Sr-Nd isotopes and geochemistry of granite-gneiss complexes from the Meatiq and Hafafit domes, Eastern Desert, Egypt: No evidence for pre-Neoproterozoic crust. Journal of African Earth Sciences 57, 31-40.
- Longhi, J., Vander Auwera, J., Fram, M.S., Duchesne, J., 1999. Some Phase Equilibrium Constraints on the Origin of Proterozoic (Massif) Anorthosites and Related Rocks. Journal of Petrology 40, 339-362.

- Longhi, J., Fram, M.S., Vander Auwera, J., Montieth, J.N., 1993. Pressure effects, kinetics, and rheology of anorthositic and related magmas. American Mineralogist 78, 1016-1030.
- Ludwig, K.R., 2003. User's manual for Isoplot 3.00 A Geochronological Toolkit for Excel. Berkeley Geochronological Center Special Publication 4.
- Lundberg, B., 1973. Granite intrusions in the Dal group, Central Sweden. GFF 95, 113-119.
- Lundmark, A.M., Corfu, F., 2008. Late-orogenic Sveconorwegian massif anorthosite in the Jotun Nappe Complex, SW Norway, and causes of repeated AMCG magmatism along the Baltoscandian margin. Contributions to Mineralogy and Petrology 155, 147-163.
- Lundmark, A.M., Corfu, F., Spürgin, S., Selbekk, R.S., 2007. Proterozoic evolution and provenance of the high-grade Jotun Nappe Complex, SW Norway: U-Pb geochronology. Precambrian Research 159, 133-154.
- Marsh, B.D., 1982. On the mechanics of igneous diapirism, stoping, and zone melting. American Journal of Science 282, 808-855.
- Martin, R.F., 2006. A-type granites of crustal origin ultimately result from open-system fenitization-type reactions in an extensional environment. Lithos 91, 125-136.
- Maruyama, S., Santosh, M., Zhao, D., 2007. Superplume, supercontinent, and post-perovskite: Mantle dynamics and anti-plate tectonics on the Core-Mantle Boundary. Gondwana Research 11, 7-37.
- Mattinson, J.M., 1997. Analysis of zircon by multi-step partial dissolutions: The good, the bad, and the ugly. Geological Association of Canada Annual Meeting, Program with abstracts, Ontario, A98.
- Mattinson, J.M., 2005. Zircon U–Pb chemical abrasion ("CA-TIMS") method: Combined annealing and multi-step partial dissolution analysis for improved precision and accuracy of zircon ages. Chemical Geology 220, 47-66.
- McCammon, C., 2005. The paradox of mantle redox. Science 308, 807-808.
- McCulloch, M.T., Gamble, J.A., 1991. Geochemical and geodynamical constraints on subduction zone magmatism. Earth and Planetary Science Letters 102, 358-374.
- McCurry, M., Hayden, K.P., Morse, L.H., Mertzman, S., 2008. Genesis of post-hotspot, A-type rhyolite of the Eastern Snake River Plain volcanic field by extreme fractional crystallization of olivine tholeiite. Bulletin of Volcanology 70, 361-383.
- Menuge, J.F., 1988. The petrogenesis of massif anorthosites: a Nd and Sr isotopic investigation of the Proterozoic of Rogaland/Vest-Agder, SW Norway. Contributions to Mineralogy and Petrology 98, 363.
- Menuge, J.F., Brewer, T.S., 1996. Mesoproterozoic anorogenic magmatism in southern Norway. In Brewer, T.S.(ed.), Precambrian crustal evolution in the North Atlantic Region. Geological Society of London, Special Publication 112, 275-295.
- Menuge, J.F., Daly, J.S., 1994. The Annagh Gneiss Complex in County Mayo, Ireland. In: Gibbons, W. and Harris, A.L. (Eds.), A Revised Correlation of Precambrian Rocks in the British Isles. Geological Society of London Special Report 22, 59-62.
- Miller, C.F., McDowell, S.M., Mapes, R.W., 2003. Hot and cold granites: Implications of zircon saturation temperatures and preservation of inheritance. Geology 31, 529-532.
- Miller, R.G., O'Nions, R.K., Hamilton, P.J., Welin, E., 1986. Crustal residence ages of clastic sediments, orogeny and continental evolution. Chemical Geology 57, 87-99.

- Mitchell, J.N., Scoates, J.S., Frost, C.D., Kolker, A., 1996. The geochemical evolution of anorthosite residual magmas in the Laramie anorthosite complex, Wyoming. Journal of Petrology 37, 637-660.
- Möller, A., O'Brien, P.J., Kennedy, A., Kröner, A., 2002. Polyphase zircon in ultrahigh-temperature granulites (Rogaland, SW Norway): constraints for Pb diffusion in zircon. Journal of Metamorphic Geology 20, 727.
- Möller, A., O'Brien, P.J., Kennedy, A., Kröner, A., 2003. Linking growth episodes of zircon and metamorphic textures to zircon chemistry: An example from the ultrahigh-temperature granulites of Rogaland (SW Norway). Geological Society Special Publication, 65-81.
- Möller, C., Andersson, J., Lundqvist, I., Hellström, F., 2007. Linking deformation, migmatite formation and zircon U-Pb geochronology in polymetamorphic orthogneisses, Sveconorwegian Province, Sweden. Journal of Metamorphic Geology 25, 727-750.
- Moorbath, S., 1978. Timing of continental growth and emergence. Nature 273, 75-76.
- Morton, A.C., Taylor, P.N., 1991. Geochemical and isotopic constraints on the nature and age of basement rocks from Rockall Bank, NE Atlantic. Journal of the Geological Society 148, 631-634.
- Muir, R.J., Fitches, W.R., Maltman, A.J., 1994. The Rhinns Complex: Proterozoic basement on Islay and Colonsay, Inner Hebrides, Scotland, and on Inishtrahull, NW Ireland. Transactions of the Royal Society of Edinburgh: Earth Sciences 85, 77-90.
- Murphy, J.B., Nance, R.D., 2003. Do supercontinents introvert or extrovert?: Sm-Nd isotope evidence. Geology 31, 873-876.
- Murphy, J.B., Nance, R.D., Gutiérrez-Alonso, G., Keppie, J.D., 2009. Supercontinent reconstruction from recognition of leading continental edges. Geology 37, 595-598.
- Myers, J.D., Krishna Sinha, A., Marsh, B.D., 1984. Assimiliation of crustal material by basaltic magma: strontium isotopic and trace element data from the Edgecumbe volcanic field, SE Alaska. Journal of Petrology 25, 1-26.
- Naterstad, J., Andresen, A., Jorde, K., 1973. Tectonic succession of the Caledonian Nappe Front in the Haukelisæter-Røldal Area, Southwestern Norway. NGU Bulletin 292, 1-20.
- Nekvasil, H., Dondolini, A., Horn, J., Filiberto, J., Long, H., Lindsley, D.H., 2004. The origin and evolution of silica-saturated alkalic suites: An experimental study. Journal of Petrology 45, 693-721.
- Nekvasil, H., Dondolini, A., Litvin, V., Rossier, L., Lindsley, D., 2001. Linking tholeiites and alkalic rocks: the role of dissolved water. GSA Annual Meeting, Abstracts, 33-0.
- Nowell, G., Parrish, R.R., 2001. Simultaneous acquisition of isotope compositions and parent/daughter ratios by non-isotope dilution solution-mode Plasma Ionisation Multi-collector Mass Spectrometry (PIMMS). 7th International Conference on Plasma Source Mass Spectrometry 267, 298-310.
- O'Nions, R.K., Evensen, N.M., Hamilton, P.J., 1979. Geochemical modeling of mantle differentiation and crustal growth. Journal of Geophysical Research 84, 6091-6101.
- Park, R.G., Åhäll, K., Boland, M.P., 1991. The Sveconorwegian shear-zone network of SW Sweden in relation to mid-Proterozoic plate movements. Precambrian Research 49, 245-260.
- Parkinson, I.J., Arculus, R.J., 1999. The redox state of subduction zones: Insights from arc-peridotites. Chemical Geology 160, 409-423.

- Patchett, P.J., Tatsumoto, M., 1981. A routine high-precision method for Lu-Hf isotope geochemistry and chronology. Contributions to Mineralogy and Petrology 75, 263-267.
- Patiño Douce, A.E., 1997. Generation of metaluminous A-type granites by low-pressure melting of calcalkaline granitoids. Geology 25, 743-746.
- Paulsson, O., Andréasson, P.-G., 2002. Attempted break-up of Rodinia at 850 Ma: Geochronological evidence from the Seve-Kalak Superterrane, Scandinavian Caledonides. Journal of the Geological Society 159, 751-761.
- Payne, J.L., Ferris, G., Barovich, K.M., Hand, M., 2010. Pitfalls of classifying ancient magmatic suites with tectonic discrimination diagrams: An example from the Paleoproterozoic Tunkillia Suite, southern Australia. Precambrian Research 177, 227-240.
- Payne, J.L., Hand, M., Barovich, K.M., Reid, A., Evans, D.A.D., 2009. Correlations and reconstruction models for the 2500-1500 Ma evolution of the Mawson Continent. In: Reddy, S.M., Mazumber, R., Evans, D.A.D. & Collins, A.S. (Eds.) Palaeoproterozoic Supercontinents and Global Evolution. Geological Society of London, Special Publication 323, 319-355.
- Pearce, J.A., 1983. Role of the sub-continental lithosphere in magma genesis at active continental margins. In: Hawesworth, C.J. & Norry, M.J. (eds.) Continental Basalts and Mantle Xenoliths, Cheshire, U.K., Shiva Publishing Limited, 230-249.
- Pearce, J.A., 1982. Trace element characteristics of lavas from destructive plate boundaries. In: Thorpe, R.S. (ed.) Andesites: Orogenic Andesites and Related Rocks, Chichester, U.K., John Wiley & Sons, 525-548.
- Pearce, J.A., Kempton, P.D., Nowell, G.M., Noble, S.R., 1999. Hf-Nd element and isotope perspective on the nature and provenance of mantle and subduction components in Western Pacific Arc-basin systems. Journal of Petrology 40, 1579-1611.
- Peck, W.H., Valley, J.W., Corriveau, L., Davidson, A., McLelland, J., Farber, D.A., 2004. Oxygenisotope constraints on terrane boundaries and origin of 1.18-1.13 Ga granitoids in the southern Grenville Province. In: Tollo, R.P., Corriveau, L., McLelland, J. and Bartholomew, M.J.I. (Eds.), Proterozoic Tectonic Evolution of the Grenville Orogen in North America. Geological Society of America Memoir 197, 163-182.
- Pedersen, S., Andersen, T., Konnerup-Madsen, J., Griffin, W.L., 2009. Recurrent Mesoproterozoic continental magmatism in South-Central Norway. International Journal of Earth Science 98, 1151-1171.
- Peng, P., Zhai, M., Ernst, R.E., Guo, J., Liu, F., Hu, B., 2008. A 1.78 Ga large igneous province in the North China craton: The Xiong'er Volcanic Province and the North China dyke swarm. Lithos 101, 260-280.
- Persson, P.O., Wahlgren, C.H., Hansen, B.T., 1983. U-Pb ages of Proterozoic metaplutonics in the gneiss complex of southern Varmland, south-western Sweden. GFF 105, 1-8.
- Pesonen, L.J., Elming, S.-Å., Mertanen, S., Pisarevsky, S., D'Agrella-Filho, M.S., Meert, J.G., Schmidt, P.W., Abrahamsen, N., Bylund, G., 2003. Palaeomagnetic configuration of continents during the Proterozoic. Tectonophysics 375, 289-324.
- Petford, N., Cruden, A.R., McCaffrey, K.J.W., Vigneresse, J.-L., 2000. Granite magma formation, transport and emplacement in the Earth's crust. Nature 408, 669-673.
- Philpotts, J.A., Schnetzler, C.C., 1970. Phenocryst-matrix partition coefficients for K, Rb, Sr and Ba, with applications to anorthosite and basalt genesis. Geochimica et Cosmochimica Acta 34, 307-322.
- Pietranik, A.B., Hawkesworth, C.J., Storey, C., Kemp, T., 2009. Depleted mantle evolution and how it is recorded in zircon. Geochimica et Cosmochimica Acta 73, Supplement 1, A1028.

- Piontek, J.E., Connelly, J.N., Åhäll, K.-I., 1998. 1.3 Ga anorogenic magmatism in Southwest Sweden. GSA Annual Meeting 30, A293.
- Plank, T., Langmuir, C.H., 1993. Tracing trace elements from sediment input to volcanic output at subduction zones. Nature 362, 739-743.
- Pózer Bue, E., 2008. Age and origin of the Mesoproterozoic basement of the Nesodden Peninsula, SE Norway, A geochronological and isotopic study. Unpublished Masters Thesis. University of Oslo.
- Putirka, K.D., Kuntz, M.A., Unruh, D.M., Vaid, N., 2009. Magma evolution and ascent at the craters of the moon and neighboring volcanic fields, Southern Idaho, USA: Implications for the evolution of polygenetic and monogenetic volcanic fields. Journal of Petrology 50, 1639-1665.
- Ragnhildstveit, J., Sigmond, E.M.O., Tucker, R.D., 1994. Early Proterozoic supracrustal rocks west of the Mandal-Ustaoset fault zone, Hardangervidda, South Norway. Terra Nova Abstract Supplement 2, 15-16.
- Reagan, M.K., Sims, K.W.W., Erich, J., Thomas, R.B., Cheng, H., Edwards, R.L., Layne, G., Ball, L., 2003. Time-scales of differentiation from mafic parents to rhyolite in North American Continental Arcs. Journal of Petrology 44, 1703-1726.
- Rehnström, E.F., 2003. Geochronology and petrology of the Tielma Magmatic Complex, northern Swedish Caledonides - Results and tectonic implications. Norsk Geologisk Tidsskrift 83, 243-257.
- Rehnstrom, E.F., Corfu, F., 2004. Palaeoproterozoic U-Pb ages of autochthonous and allochthonous granites from the northern Swedish Caledonides - Regional and palaeogeographic implications. Precambrian Research 132, 363-378.
- Rehnström, E.F., Corfu, F., Torsvik, T.H., 2002. Evidence of a late Precambrian (637 Ma) deformational event in the Caledonides of northern Sweden. Journal of Geology 110, 591-601.
- Rehnström, E.F., Torsvik, T.H., 2003. Cambrian sediments and Proterozoic granites in the Dividalen-Torneträsk area, northern Scandinavia: Palaeomagnetism and U-Pb geochronology. GFF 125, 131-138.
- Rimša, A., Johansson, L., Whitehouse, M.J., 2007. Constraints on incipient charnockite formation from zircon geochronology and rare earth element characteristics. Contributions to Mineralogy and Petrology 154, 357-369.
- Roberts, D., 2007. Palaeocurrent data from the Kalak Nappe Complex, northern Norway: A key element in models of terrane affiliation. Norsk Geologisk Tidsskrift 87, 319-328.
- Roberts, D., 2003. The Scandinavian Caledonides: Event chronology, palaeogeographic settings and likely modern analogues. Tectonophysics 365, 283-299.
- Roberts, D., Gee, D.G., 1985. An introduction to the structure of the Scandinavian Caledonides. In: Gee, D.G. & Sturt, B.A. (eds.) The Caledonian Orogen - Scandinavia and Related areas, Chichester, U.K., John Wiley & Sons, 56-68.
- Roberts, D., Nissen, A.L., Walker, N., 1999. U-Pb zircon age and geochemistry of the Blafjellhatten granite, Grong-Olden Culmination, Central Norway. Norsk Geologisk Tidsskrift 79, 161-168.
- Rogers, J.J.W., Santosh, M., 2002. Configuration of Columbia, a Mesoproterozoic Supercontinent. Gondwana Research 5, 5-22.
- Røhr, T.S., Corfu, F., Austrheim, H., Andersen, T.B., 2004. Sveconorwegian U-Pb zircon and monazite ages of granulite-facies rocks, Hisarøya, Gulen, Western Gneiss Region, Norway. Norsk Geologisk Tidsskrift 84, 251-256.

- Rollinson, H.R., 1993. Using geochemical data: evaluation, presentation, interpretation. Longman Geochemistry Series, London, 66-71.
- Romer, R.L., 1996. Contiguous Laurentia and Baltica before the Grenvillian-Sveconorwegian orogeny? Terra Nova 8, 173-181.
- Romer, R.L., 2003. Alpha-recoil in U-Pb geochronology: Effective sample size matters. Contributions to Mineralogy and Petrology 145, 481-491.
- Romer, R.L., Smeds, S.A., 1996. U-Pb columbite ages of pegmatites from Sveconorwegian terranes in southwestern Sweden. Precambrian Research 76, 15-30.
- Root, D.B., Hacker, B.R., Gans, P.B., Ducea, M.N., Eide, E.A., Mosenfelder, J.L., 2005. Discrete ultrahigh-pressure domains in the Western Gneiss Region, Norway: Implications for formation and exhumation. Journal of Metamorphic Geology 23, 45-61.
- Root, D.B., Hacker, B.R., Mattinson, J.M., Wooden, J.L., 2004. Zircon geochronology and ca. 400 Ma exhumation of Norwegian ultrahigh-pressure rocks: An ion microprobe and chemical abrasion study. Earth and Planetary Science Letters 228, 325-341.
- Rowe, M.C., Kent, A.J.R., Nielsen, R.L., 2009. Subduction influence on oxygen fugacity and trace and volatile elements in basalts across the cascade volcanic arc. Journal of Petrology 50, 61-91.
- Rudnick, R.L., Gao, S., 2003. Composition of the continental crust. Treatise on Geochemistry 3, 1-64.
- Sakuyama, M., 1981. Petrological study of the Myoko and Kurohime volcanoes, Japan: crystallization sequence and evidence for magma mixing. Journal of Petrology 22, 553-583.
- Salters, V.J.M., Stracke, A., 2004. Composition of the depleted mantle. Geochemisty Geophysics Geosystems 5.
- Santosh, M., 2010. Assembling North China Craton within the Columbia supercontinent: The role of double-sided subduction. Precambrian Research 178, 149-167.
- Saunders, A.D., Norry, M.J., Tarney, J., 1991. Fluid influence on the trace element compositions of subduction zone magmas. Philosophical Transactions of the Royal Society of London, A335, 377-392.
- Saunders, A.D., Tarney, J., Weaver, S.D., 1980. Transverse geochemical variations across the Antarctic Peninsula: Implications for the genesis of calc-alkaline magmas. Earth and Planet Science Letters 46, 344-360.
- Schärer, U., 1980. U-Pb and Rb-Sr dating of a polymetamorphic nappe terrain: The Caledonian Jotun nappe, southern Norway. Earth and Planeary Science Letters 49, 205-218.
- Schärer, U., Wilmart, E., Duchesne, J.-C., 1996. The short duration and anorogenic character of anorthosite magmatism: U-Pb dating of the Rogaland complex, Norway. Earth and Planetary Science Letters 139, 335-350.
- Schellart, W.P., 2008. Subduction zone trench migration: Slab driven or overriding-plate-driven? Physics of the Earth and Planetary Interiors 170, 73-88.
- Schellart, W.P., Stegman, D.R., Freeman, J., 2008. Global trench migration velocities and slab migration induced upper mantle volume fluxes: Constraints to find an Earth reference frame based on minimizing viscous dissipation. Earth Science Reviews 88, 118-144.
- Scherstén, A., 2002. <sup>187</sup>Re-<sup>187</sup>Os evidence for crustal lenses of Svecofennian age within the Mylonite Zone, SW Sweden. GFF 124, 35-39.

- Schiellerup, H., Lambert, D.D., Prestvik, T., Robins, B., McBride, J.S., Larsen, R.B., 2000. Re-Os isotopic evidence for a lower crustal origin of massif-type anorthosites. Nature 405, 781-784.
- Schmitz, M.D., Schoene, B., 2007. Derivation of isotope ratios, errors, and error correlations for U-Pb geochronology using <sup>205</sup>Pb-<sup>235</sup>U-(<sup>233</sup>U)-spiked isotope dilution thermal ionization mass spectrometric data. Geochemistry Geophysics Geosystems 8.
- Schnetzler, C.C., Philpotts, J.A., 1970. Partition coefficients of rare-earth elements between igneous matrix material and rock-forming mineral phenocrysts-II. Geochimica et Cosmochimica Acta 34, 331-340.
- Schock, H.H., 1979. Distribution of rare-earth and other trace elements in magnetites. Chemical Geology 26, 119-133.
- Scholl, D.W., Von Huene, R., 2009. Implications of estimated magmatic additions and recycling losses at the subduction zones of accretionary (non-collisional) and collisional (suturing) orogens. In: Cawood, P.A. & Kröner, A. (eds.) Earth Accretionary Systems in Space and Time, Geological Society of London, Special Publication 318, 105-125.
- Scholl, D.W., Von Huene, R., 2007. Crustal recycling at modern subduction zones applied to the pastissues of growth and preservation of continental basement crust, mantle geochemistry, and supercontinent reconstruction. In: Hatcher, R.D., Carlson, M.P., McBride, J.J., & Martínez Catalán, J.R. (eds.) 4-D Framework of Continental Crust, Geological Society of America Memoir 200, 9-32.
- Schwartz, J.J., John, B.E., Cheadle, M.J., Miranda, E.A., Grimes, C.B., Wooden, J.L., Dick, H.J.B., 2005. Dating the growth of oceanic crust at a slow-spreading ridge. Science 310, 654-657.
- Scoates, J.S., Frost, C.D., Mitchell, J.N., Lindsley, D.H., Frost, B.R., 1996. Residual-liquid origin for a monzonitic intrusion in a mid-Proterozoic anorthosite complex: The Sybille intrusion, Laramie anorthosite complex, Wyoming. Bulletin of the Geological Society of America 108, 1357-1371.
- Shuto, K., Ishimoto, H., Hirahara, Y., Sato, M., Matsui, K., Fujibayashi, N., Takazawa, E., Yabuki, K., Sekine, M., Kato, M., Rezanov, A.I., 2006. Geochemical secular variation of magma source during Early to Middle Miocene time in the Niigata area, NE Japan: Asthenospheric mantle upwelling during back-arc basin opening. Lithos 86, 1-33.
- Sigmond, E.M.O., 1975. Geologisk kart over Norge, berggrunnskart Sauda, 1:250000. Geological Survey of Norway
- Sigmond, E.M.O., 1978. Beskrivelse til det berggrunnsgeologiske kartbladet Sauda 1:250000. NGU Bulletin 341, 1-94.
- Sigmond, E.M.O., 1998. Bedrock geology map, Odda, 1:250,000. Geological Survey of Norway.
- Sigmond, E.M.O., Andresen, A., 1976. A Rb-Sr isochron age on metaandesites from Skorpehei, Suldal, south Norway. Norsk Geologisk Tidsskrift 56, 315-319.
- Sigmond, E.M.O., Birkeland, A., Bingen, B., 2000. A possible basement to the Mesoproterozoic quartzites on Hardangervidda, South-central Norway: zircon U-Pb geochronology of a migmatitic gneiss. NGU Bulletin 437, 25-32.

Sigmond, E.M.O., Gjelle, S., Solli, A., 1997. The Rjukan Proterozoic rift basin, its basement and cover, volcanic and

sedimentary infill, and associated intrusions. Norges Geologiske Undersøkelse Bulletin 433, 6-7.

Simon, L., Lécuyer, C., 2005. Continental recycling: The oxygen isotope point of view. Geochemisty Geophysics Geosystems 6, Q08004.

- Sisson, T.W., Grove, T.L., 1993. Experimental investigations of the role of H2O in calc-alkaline differentiation and subduction zone magmatism. Contributions to Mineralogy and Petrology 113, 143-166.
- Sisson, T.W., Layne, G.D., 1993. H<sub>2</sub>O in basalt and basaltic andesite glass inclusions from four subduction-related volcanoes. Earth and Planetary Science Letters 117, 619-635.
- Sisson, T.W., Ratajeski, K., Hankins, W.B., Glazner, A.F., 2005. Voluminous granitic magmas from common basaltic sources. Contributions to Mineralogy and Petrology 148, 635-661.
- Skår, Ø., 2002. U-Pb geochronology and geochemistry of early Proterozoic rocks of the tectonic basement windows in central Nordland, Caledonides of north-central Norway. Precambrian Research 116, 265-283.
- Skår, Ø., Furnes, H., Claesson, S., 1994. Proterozoic orogenic magmatism within the Western Gneiss Region, Sunnfjord, Norway. Norsk Geologisk Tidsskrift 74, 114-126.
- Skår, Ø., Pedersen, R.-B., 2003. Relations between granitoid magmatism and migmatization: U Pb geochronological evidence from the Western Gneiss Complex, Norway. Journal of the Geological Society 160, 935-946.
- Slagstad, T., Marker, M., Skår, Ø., 2008. Mesoproterozoic growth, rifting, drifting and continental collision in Rogaland, SW Sveconorwegian Province. Abstract HPP-001, 33<sup>rd</sup> International Geological Congress, Oslo, 6–14 August.
- Slagstad, T., Culshaw, N.G., Daly, J.S., Jamieson, R.A., 2009. Western Grenville Province holds key to midcontinental Granite-Rhyolite Province enigma. Terra Nova 21, 181-187.
- Slagstad, T., Culshaw, N.G., Jamieson, R.A., Ketchum, J.W.F., 2004. Early Mesoproterozoic tectonic history of the southwestern Grenville Province, Ontario: Constraints from geochemistry and geochronology of high-grade gneisses. In: Tollo, R.P., Corriveau, L., McLelland, J. and Bartholomew, M.J.I. (Eds.), Proterozoic Tectonic Evolution of the Grenville Orogen in North America. Geological Society of America Memoir 197, 209-241.
- Slagstad, T., Jamieson, R.A., Culshaw, N.G., 2005. Formation, crystallization, and migration of melt in the mid-orogenic crust: Muskoka domain migmatites, Grenville Province, Ontario. Journal of Petrology 46, 893-919.
- Sláma, J., Košler, J., Condon, D.J., Crowley, J.L., Gerdes, A., Hanchar, J.M., Horstwood, M.S.A., Morris, G.A., Nasdala, L., Norberg, N., Schaltegger, U., Schoene, B., Tubrett, M.N., Whitehouse, M.J., 2008. Plešovice zircon — A new natural reference material for U–Pb and Hf isotopic microanalysis. Chemical Geology 249, 1-35.
- Smith, I.E.M., Worthington, T.J., Stewart, R.B., Price, R.C., Gamble, J.A., 2003. Felsic volcanism in the Kermadec arc, SW Pacific: Crustal recycling in an oceanic setting. Geological Society Special Publication, 99-118.
- Snyder, D., Carmichael, I.S.E., Wiebe, R.A., 1993. Experimental study of liquid evolution in an Fe-rich, layered mafic intrusion: constraints of Fe-Ti oxide precipitation on the T-f<sub>02</sub> and T-ρ paths of tholeiitic magmas. Contributions to Mineralogy and Petrology 113, 73-86.
- Söderlund, U., Ask, R., 2006. Mesoproterozoic bimodal magmatism along the Protogine Zone, S Sweden: Three magmatic pulses at 1.56, 1.22 and 1.205 Ga, and regional implications. GFF 128, 303-310.
- Söderlund, U., Elming, S., Ernst, R.E., Schissel, D., 2006. The Central Scandinavian Dolerite Group -Protracted hotspot activity or back-arc magmatism? Constraints from U-Pb baddeleyite geochronology and Hf isotope data. Precambrian Research 150, 136.
- Söderlund, U., Isachsen, C.E., Bylund, G., Heaman, L.M., Patchett, P.J., Vervoort, J.D., Andersson, U.B., 2005. U-Pb Baddelyite ages and Hf, Nd isotope chemistry constraining repeated mafic magmatism

in the Fennoscandian Shield from 1.6 to 0.9 Ga. Contributions to Mineralogy and Petrology 150, 174.

- Söderlund, U., Jarl, L.-G., Persson, P.-O., Stephens, M.B., Wahlgren, C.-H., 1999. Protolith ages and timing of deformation in the eastern, marginal part of the Sveconorwegian orogen, southwestern Sweden. Precambrian Research 94, 29-48.
- Soderlund, U., Möller, C., Andersson, J., Johansson, L., Whitehouse, M., 2002. Zircon geochronology in polymetamorphic gneisses in the Sveconorwegian orogen, SW Sweden: ion microprobe evidence for 1.46-1.42 and 0.98-0.96 Ga reworking. Precambrian Research 113, 193-225.
- Soderlund, U., Patchett, P.J., Vervoort, J.D., Isachsen, C.E., 2004. The <sup>176</sup>Lu decay constant determined by Lu-Hf and U-Pb isotope systematics of Precambrian mafic intrusions. Earth and Planetary Science Letters 219, 311-324.
- Solli, A., Naterstad, J., Andresen, A., 1978. Structural succession in a part of the outer Hardangerfjord area, west Norway. Norges Geologiske Undersøkelse 343, 39-51.
- Spulber, S.D., Rutherford, M.J., 1983. The origin of rhyolite and plagiogranite in oceanic crust: an experimental study. Journal of Petrology 24, 1-25.
- Starmer, I.C., 1996. Accretion, rifting, rotation and collision in the North Atlantic supercontinent, 1770-950 Ma. In Brewer, T.S. (ed.) Precambrian crustal evolution in the North Atlantic Regions. Geological Society of London, Special Publication 112, 219-248.
- Stein, H.J., Bingen, B., 2002. 1.05-1.01 Ga Sveconorwegian metamorphism and deformation of the supracrustal sequence at Sæsvatn, South Norway: Re-Os dating of Cu-Mo mineral occurrences. In: Blundell, D., Neubauer, F. and von Quadt, A. (Eds.) The Timing and Location of Major Ore Deposits in an Evolving Orogen. Geological Society of London, Special Publication 204, 313-335.
- Stephens, M.B., Gee, D.G., 1985. A tectonic model for the eugeoclinal terranes in the central Scandinavian Caledonides. In: Gee, D.G. & Sturt, B.A. (eds.) The Caledonian Orogen -Scandinavia and Related areas, Chichester, U.K., John Wiley & Sons, 953-970.
- Stephens, M.B., Wahlgren, C.-H., Weijermars, R., 1996. Left-lateral transpressive deformation and its tectonic implications, Sveconorwegian orogen, Baltic Shield, southwestern Sweden. Precambrian Research 79, 261-279.
- Storey, C.D., Jeffries, T.E., Smith, M., 2006. Common lead-corrected laser ablation ICP-MS U-Pb systematics and geochronology of titanite. Chemical Geology 227, 37-52.
- Stout, M.Z., Nicholls, J., Kuntz, M.A., 1994. Petrological and mineralogical variations in 2500-2000 yr B.P. lava flows, Craters on the Moon lava field, Idaho. Journal of Petrology 35, 1681-1715.
- Stracke, A., Bizimis, M., Salters, V.J.M., 2003. Recycling oceanic crust: Quantitative constraints. Geochemistry Geophysics Geosystems 4 (3).
- Sun, S.S., McDonough, 1989. Chemical and isotopic systematics of oceanic basalts: implications for mantle composition and processes. In: Saunders, A.D. and Norry, M.J. (Eds.), Magmatism in the Ocean Basins. Geological Society of London, Special Publication 42, 313-345.
- Tamaki, K., 1995. Opening tectonics of the Japan Sea. In: Taylor, B. (ed.) Backarc Basins: Tectonics and Magmatism, Plenum Press, New York, 407-420.
- Tamura, Y., Tatsumi, Y., 2002. Remelting of an andesitic crust as a possible origin for rhyolitic magma in oceanic arcs: An example from the Izu-Bonin arc. Journal of Petrology 43, 1029-1047.
- Thirlwall, M.F., Graham, A.M., 1984. Evolution of high-Ca, high-Sr C-series basalts from Grenada, Lesser Antilles: the effects of intra-crustal contamination. Journal of the Geological Society 141, 427-445.

- Thompson, R.N., Morrison, M.A., Dickin, A.P., Hendry, G.L., 1983. Continental flood basalts...arachnids rule OK? . In: Hawkesworth, C.J. & Norry, M.J. (eds.) Continental Basalts and Mantle Xenoliths, Cheshire, U.K., Shiva Publishing Limited, 158-185.
- Thy, P., Lesher, C.E., Nielsen, T.F.D., Brooks, C.K., 2006. Experimental constraints on the Skaergaard liquid line of descent. Lithos 92, 154-180.
- Tobi, A.C., Hermans, G.A.E.M., Maijer, C., Jansen, J.B.H., 1985. Metamorphic zoning in the high-grade Proterozoic of Rogaland - Vest Agder, SW Norway. In Tobi, A.C., Touret, J.L.R.(eds.), The Deep Proterozoic Crust in the North Atlantic Provinces, NATO Advanced Study Institute Series, 477-497.
- Toplis, M.J., Carroll, M.R., 1995. An experimental study of the influence of oxygen fugacity on Fe-Ti oxide stability, phase relations, and mineral-melt equilibria in ferro-basaltic systems. Journal of Petrology 36, 1137-1170.
- Torkse, T., 1985. Terrain displacement and Sveconorwegian rotation of the Baltic Shield: a working hypothesis. In Tobi, A.C., Touret, J.L.R.(eds.), The Deep Proterozoic Crust in the North Atlantic Provinces, NATO Advanced Study Institute Series, 333-343.
- Tucker, R.D., Krogh, T.E., Råheim, A., 1990. Proterozoic evolution and age province boundaries in the central part of the Western Gneiss Region, Norway: results of U-Pb dating of accessory minerals from Trondheimsfjord to Geiranger. In: Gower, C.F., Rivers, T. and Ryan, B. (Eds.) Mid-Proterozoic Laurentia-Baltica. Geological Association of Canada, Special Paper 38, 149-173.
- Tucker, R.D., Råheim, A., Krogh, T.E., Corfu, F., 1987. Uranium-lead zircon and titanite ages from the northern portion of the Western Gneiss Region, south-central Norway. Earth and Planetary Science Letters 81, 203-211.
- Tucker, R.D., Robinson, P., Solli, A., Gee, D.G., Thorsnes, T., Krogh, T.E., Nordgulen, Ø., Bickford, M.E., 2004. Thrusting and extension in the Scandian Hinterland, Norway: New U-Pb ages and tectonostratigraphic evidence. American Journal of Science 304, 477-532.
- Valley, J.W., 2003. Oxygen isotopes in zircon. Reviews in Mineralogy and Geochemistry 53, 343-385.
- Valley, J.W., Kinny, P.D., Schulze, D.J., Spicuzza, M.J., 1998. Zircon megacrysts from kimberlite: Oxygen isotope variability among mantle melts. Contributions to Mineralogy and Petrology 133, 1-11.
- Valley, J.W., Lackey, J.S., Cavosie, A.J., Clechenko, C.C., Spicuzza, M.J., Basei, M.A.S., Bindeman, I.N., Ferreira, V.P., Sial, A.N., King, E.M., Peck, W.H., Sinha, A.K., Wei, C.S., 2005. 4.4 billion years of crustal maturation: Oxygen isotope ratios of magmatic zircon. Contributions to Mineralogy and Petrology 150, 561-580.
- Vander Auwera, J., Bogaerts, M., Liégeois, J.-P., Demaiffe, D., Wilmart, E., Bolle, O., Duchesne, J.-C., 2003. Derivation of the 1.0-0.9 Ga ferro-potassic A-type granitoids of southern Norway by extreme derivation from basic magmas. Precambrian Research 124, 107-148.
- Vander Auwera, J., Longhi, J., Duchesne, J.-C, 1998. A Liquid Line of Descent of the Jotunite (Hypersthene Monzodiorite) Suite. Journal of Petrology 39, 439-468.
- Vander Auwera, J., Bogaerts, M., Bolle, O., Longhi, J., 2008. Genesis of intermediate igneous rocks at the end of the Sveconorwegian (Grenvillian) orogeny (S Norway) and their contribution to intracrustal differentiation. Contributions to Mineralogy and Petrology 156, 721-743.
- Vander Auwera, J., Longhi, J., 1994. Experimental study of a jotunite (hypersthene monzodiorite): constraints on the parent magma composition and crystallization conditions (P, T, f<sub>02</sub>) of the Bjerkreim-Sokndal layered intrusion (Norway). Contributions to Mineralogy and Petrology 118, 60-78.

- Vervoort, J.D., Patchett, P.J., 1996. Behavior of hafnium and neodymium isotopes in the crust: constraints from Precambrian crustally derived granites. Geochimica et Cosmochimica Acta 60, 3717-3723.
- Vervoort, J.D., Patchett, P.J., Gehrels, G.E., Nutman, A.P., 1996. Constraints on early Earth differentiation from hafnium and neodymium isotopes. Nature 379, 624-627.
- Villiger, S., Ulmer, P., Müntener, O., Thompson, A.B., 2004. The liquid line of descent of anhydrous, mantle-derived, tholeiitic liquids by fractional and equilibrium crystallization - An experimental study at 1.0 GPa. Journal of Petrology 45, 2369-2388.
- Vogel, T.A., Flood, T.P., Patino, L.C., Wilmot, M.S., Maximo, R.P.R., Arpa, C.B., Arcilla, C.A., Stimac, J.A., 2006. Geochemistry of silicic magmas in the Macolod Corridor, SW Luzon, Philippines: Evidence of distinct, mantle-derived, crustal sources for silicic magmas. Contributions to Mineralogy and Petrology 151, 267-281.
- Vroon, P.Z., Lowry, D., Van Bergen, M.J., Boyce, A.J., Mattey, D.P., 2001. Oxygen isotope systematics of the Banda Arc: Low  $\delta^{18}$ O despite involvement of subducted continental material in magma genesis. Geochimica et Cosmochimica Acta 65, 589-609.
- Wade, B.P., Payne, J.L., Hand, M., Barovich, K.M., 2007. Petrogenesis of ca 1.50 Ga granitic gneiss of the Coompana Block: Filling the 'magmatic gap' of Mesoproterozoic Australia. Australian Journal of Earth Science 54, 1089-1102.
- Wager, L.R., 1960. The major element variation of the layered series of Skaergaard intrusion and a reestimation of the average composition of the hidden layered series and of the successive residual magmas. Journal of Petrology 1, 364-398.
- Watson, E.B., 1996. Dissolution, growth and survival of zircons during crustal fusion: Kinetic principles, geological models and implications for isotopic inheritance. Transactions of the Royal Society of Edinburgh, Earth Sciences 87, 43-56.
- Watson, E.B., Harrison, T.M., 1983. Zircon saturation revisited: temperature and composition effects in a variety of crustal magma types. Earth and Planetary Science Letters 64, 295-304.
- Whalen, J.B., Currie, K.L., Chappell, B.W., 1987. A-type granites: geochemical characteristics, discrimination and petrogenesis. Contributions to Mineralogy and Petrology 95, 407-419.
- Whitaker, M.L., Nekvasil, H., Lindsley, D.H., Difrancesco, N.J., 2007. The role of pressure in producing compositional diversity in intraplate basaltic magmas. Journal of Petrology 48, 365-393.
- Whitaker, M.L., Nekvasil, H., Lindsley, D.H., McCurry, M., 2008. Can crystallization of olivine tholeiite give rise to potassic rhyolites? - An experimental investigation. Bulletin of Volcanology 70, 417-434.
- Whitmeyer, S.J., Karlstrom, K.E., 2007. Tectonic model for the Proterozoic growth of North America. Geosphere 3, 220-259.

, P., Corfu, F., Griffin, W.L., Meier, M., Oberli, F., von Quadt, A., Roddick, J.C., Spiegel, W., 1995. Three natural zircon standards for U-Th-Pb, Lu-Hf, trace element and REE analyses. Geostandards Newsletter 19, 1-23.

- Wilson, M., 1989. Igneous Petrogenesis: A Global Tectonic Approach. Springer, Dordrecht, 1-466.
- Windley, B.F., 1993. Proterozoic anorogenic magmatism and its orogenic connections. Journal of the Geological Society of London 150, 39-50.
- Woodhead, J.D., Hergt, J.M., 2005. A preliminary appraisal of seven natural zircon reference materials for in situ Hf isotope determination. Geostandards and Geoanalytical Research 29, 183-195.

- Woodhead, J.D., Hergt, J.M., Davidson, J.P., Eggins, S.M., 2001. Hafnium isotope evidence for 'conservative' element mobility during subduction zone processes. Earth and Planetary Science Letters 192, 331-346.
- Workman, R.K., Eiler, J.M., Hart, S.R., Jackson, M.G., 2008. Oxygen isotopes in Samoan lavas: Confirmation of continent recycling. Geology 36, 551-554.
- Zariņš, K., Johansson, Å., 2009. U-Pb geochronology of gneisses and granitoids from the Danish island of Bornholm: New evidence for 1.47-1.45 Ga magmatism at the southwestern margin of the East European Craton. International Journal of Earth Science 98, 1561-1580.
- Zhang, S.-H., Zhao, Y., Yang, Z.-Y., He, Z.-F., Wu, H., 2009. The 1.35 Ga diabase sills from the northern North China Craton: Implications for breakup of the Columbia (Nuna) supercontinent. Earth and Planetary Science Letters 288, 588-600.
- Zhao, G., Cawood, P.A., Wilde, S.A., Sun, M., 2002. Review of global 2.1-1.8 Ga orogens: Implications for a pre-Rodinia supercontinent. Earth Science Reviews 59, 125-162.
- Zhao, G., He, Y., Sun, M., 2009. The Xiong'er volcanic belt at the southern margin of the North China Craton: Petrographic and geochemical evidence for its outboard position in the Paleo-Mesoproterozoic Columbia Supercontinent. Gondwana Research 16, 170-181.
- Zhao, G., Sun, M., Wilde, S.A., Li, S., 2004. A Paleo-Mesoproterozoic supercontinent: Assembly, growth and breakup. Earth Science Reviews. 67, 91-123.
- Zhao, G., Sun, M., Wilde, S.A., Li, S., 2003. Assembly, accretion and breakup of the Paleomesoproterozoic Columbia supercontinent: Records in the North China Craton. Gondwana Research 6, 417-434.
- Zhao, G., Sun, M., Wilde, S.A., Li, S., Zhang, J., 2006. Some key issues in reconstructions of Proterozoic supercontinents. Journal of Asian Earth Sciences 28, 3-19.
- Zhao, G., Wilde, S.A., Cawood, P.A., Sun, M., 2001. Archean blocks and their boundaries in the North China Craton: Lithological, geochemical, structural and P-T path constraints and tectonic evolution. Precambrian Research 107, 45-73.
- Zhao, X., Zhou, M., Li, J., Wu, F., 2008. Association of Neoproterozoic A- and I-type granites in South China: Implications for generation of A-type granites in a subduction-related environment. Chemical Geology 257, 1-15.
- Zhou, X.Q., Bingen, B., Demaiffe, D., Liégeois, J.-P., Hertogen, J., Weis, D., Michot, J., 1995. The 1160 Ma old Hidderskog meta-charnockite: implications of this A-type pluton for the Sveconorwegian belt in Vest Agder (SW Norway). Lithos 36, 51-66.